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FM 6-36

FIELD MANUAL

30 Aug 78

**FIELD ARTILLERY BATTERY,
LANCE**

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CHANGE

No. 1

HEADQUARTERS
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WASHINGTON, D.C. 8 April 1977

FIELD ARTILLERY BATTERY, LANCE

FM 6-36, 30 April 1973, is changed as follows:

1. Using pen and ink, make the following corrections:

Page	Paragraph	Remarks
i		Line out all of Chapter 3.
1-1	1-1	Change "ATTN: ATSFA-PL-DL" to read "ATTN: ATSF-TD-TM".
2-2		After page number "2-2" add: "(Next numbered page is 4-1)".
A-1	A-2	Change "6-20-1 Field Artillery Tactics" to read: "6-20 Fire Support for Combined Arms Operations."
A-1	A-2	Delete: "6-20-2 Field Artillery Techniques."
A-1	A-2	Delete: "(C) 6-40-2 Field Artillery Missile Gunnery (U)."
A-1	A-2	Delete: "****" preceding "(C) 6-42."
A-1		Delete: "*** To be published" at page bottom.
A-3	A-5	Delete: "****" after ATP6-595, ATT 6-595, and ASubjScd 6-15D10.
A-3		Delete "*** To be published." at page bottom.

2. Remove pages 3-1 to 3-54.

3. Remove pages Index-1 to Index-2 and insert new pages Index-1 to Index-2.

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FIELD ARTILLERY BATTERY, LANCE

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CHAPTER 1

GENERAL

1-1. Purpose and Scope

a. This manual is a guide to assist commanders in training the personnel of a Lance firing battery into an efficient, disciplined team that will operate smoothly and effectively in combat. It may also be used for training of A&T sections of service battery. This manual prescribes the duties of individuals, section drills, methods of inspection and maintenance, methods of decontamination, safety precautions, training, and tests for qualification of missilemen. Users of this manual are encouraged to consult FM 6-42, Field Artillery Battalion, Lance. FM 6-42 will provide supervisory personnel with a broader scope and information on the employment of the Lance missile system. Destruction of equipment to prevent enemy use will be as prescribed in TM 750-244-4-1.

b. The material presented herein is in agreement with International Standardization Agreements STANAG 2103, Reporting Nuclear Detonations, Radioactive Fallout, and Biological and Chemical Attacks; and STANAG 2314, Organization and Doctrine for Explosive Ordnance Disposal Operations; and is applicable without modification to both nuclear and nonnuclear warfare.

c. Drills prescribed in this manual cover the duties of individuals in assembly and disassembly, loading and off-loading, preparing for action and traveling, launcher conversion, and system checkout. In case of conflict between procedures contained herein and those prescribed in appropriate technical manuals, the procedures prescribed in the technical manuals will be followed.

d. Users of this manual are encouraged to submit recommended changes or comments to improve the manual. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons will be provided for each comment to insure understanding and complete evaluation. Comments should be prepared using DA Form 2028

(Recommended Changes to Publications) and forwarded direct to the Commandant, US Army Field Artillery School, ATTN: ATSFA-PL-DL, Fort Sill, Oklahoma 73503.

1-2. Definition of Terms

a. *Basic Vehicle.* The carrier, guided missile equipment, M667 is a member of the M113A1 family of tracked vehicles and services as the carrier for the self-propelled launcher and the loader transporter.

b. *Firing Device.* The firing device, guided missile, M91 consists of a cable reel with 100 meters of cable and a firing box assembly containing missile arming and firing switches. It is stored on the launcher except during firing operations, when it is moved to a remote firing pit.

c. *Lance Missile.* The guided missile, surface attack, XMGM-52C consists of two major sections, a warhead section (WHS) and a guided missile main assemblage (hereafter referred to as the main assemblage or MMA). The main assemblage contains the guidance and propulsion systems. Four control surfaces (fins) also are part of each complete missile.

d. *Self-Propelled Launcher (SPL).* The launcher, guided missile, carrier mounted M752, is the primary launcher configuration in the Lance firing battery and contains all equipment required to fire a missile. It is assault phase air transportable, and can swim inland waterways.

e. *Light-Weight Launcher, (LWL).* The launcher, zero length, guided missile, M740 is obtained by removing the launch fixture from the SPL and combining it with a mobility kit. It can be transported by helicopter during air-mobile operations and towed by a standard 2 1/2- or 5-ton truck.

f. *Loader-Transporter (LT).* The loader-transporter, guided missile, M688 utilizes the

same basic vehicle as the SPL and possesses the same mobility characteristics. It is equipped with a fixed length boom crane for handling a complete Lance missile, MMA, WHS, and the launch fixture. It also contains cradles for transporting two complete missile rounds or main assemblages.

g. Monitor-Programmer, (MP). The monitor-programmer, missile guidance set, AN/GJM-24 is used during system checkout to perform pre-launch monitoring and to insert velocity (range) parameters into the missile. GO/NO-GO indicators are used extensively. The MP is portable, but remains mounted to the launch fixture during firing operations.

h. Orientation.

(1) *Front*—The end of a launcher or missile at which the warhead section is located.

(2) *Right (Left)*—The direction to the right (left) of a person who is standing at the rear of, and facing the equipment. The right side is also referred to as the curb side and the left side as the road side.

1-3. References

References pertaining to the Lance missile and associated equipment and covering related matters not discussed in detail in this manual are listed in appendix A.

1-4. Abbreviations

Abbreviations used in this manual are contained in appendix B.

1-5. Nomenclature

A table showing common terms and official nomenclature is at appendix C.

CHAPTER 2

ORGANIZATION

2-1. Composition of the Lance Firing Battery

The Lance firing battery (fig. 2-1) consists of a battery headquarters, a detail platoon, a fire direction center (FDC), two firing platoons, and an assembly and transport (A&T) platoon.

a. Battery Headquarters. The battery headquarters contains the personnel and equipment necessary for administration, mess, supply, and nonmissile peculiar maintenance within the firing battery.

b. Detail Platoon. The detail platoon consists of a platoon headquarters a communication section, and two survey sections.

c. Fire Direction Center. The fire direction center contains the personnel and equipment required for performing technical fire direction on a 24-hour basis.

d. Firing Platoon. The firing platoon consists of a platoon headquarters and one firing section. It contains the personnel and equipment necessary for transporting and firing a Lance missile.

e. Assembly and Transport (A&T) Platoon. The A&T platoon consists of a platoon headquarters and two A&T sections. It contains the personnel and equipment necessary to receive, store, transport and assemble Lance missiles, convert from one launcher configuration to another and off-load the launcher. The primary function of the platoon is the resupply of the firing platoon.

2-2. Duties of Personnel

The duties of the personnel in the battery headquarters, detail platoon, and fire direction center are comparable to those of personnel in similar positions in other field artillery batteries. Since the duties of such personnel are described in detail in AR 611-101, AR 611-201, FM 6-20-2, FM 6-40-4, FM 6-140, and other appropriate field and technical manuals, they are not discussed in this manual. The duties of the firing platoon and A&T platoon personnel are discussed in *a* through *d* below.

a. Firing Platoon Headquarters Personnel.

(1) *Platoon leader.* The firing platoon leader has the same responsibilities as leaders of other field artillery firing platoons. Additional responsibilities during firing include verification of the lay of the missile, warhead settings, monitor-programmer settings and arming of the missile.

(2) *Platoon sergeant.* The platoon sergeant is the noncommissioned officer in charge of the firing platoon. He coordinates platoon operations and assists the platoon leader in performing his duties.

(3) *Radio telephone operator (RTO).* The RTO operates and monitors platoon communication equipment, serves as a driver for the platoon leader, may serve as a recorder when required, and may assist in setting up the laying equipment.

b. Firing Section Personnel.

(1) *Section chief.* The section chief is responsible to the platoon leader for—

(a) The training and efficiency of the firing section personnel.

(b) The performance of duties in section drill (tables 3-1 through 3-18).

(c) Inspection and maintenance of all section equipment.

(d) Observance of safety precautions and decontamination of equipment and materiel within the section.

(e) Preparation of field fortifications for protection of personnel and equipment.

(f) Camouflage, security, and chemical, biological, and radiological (CBR) training and discipline.

(2) *Assistant section chief (gunner).* The assistant section chief assists the section chief in performing the duties in (1) above. He performs other duties prescribed by the section chief and performs those actions specified for him in tables 3-1 through 3-18.

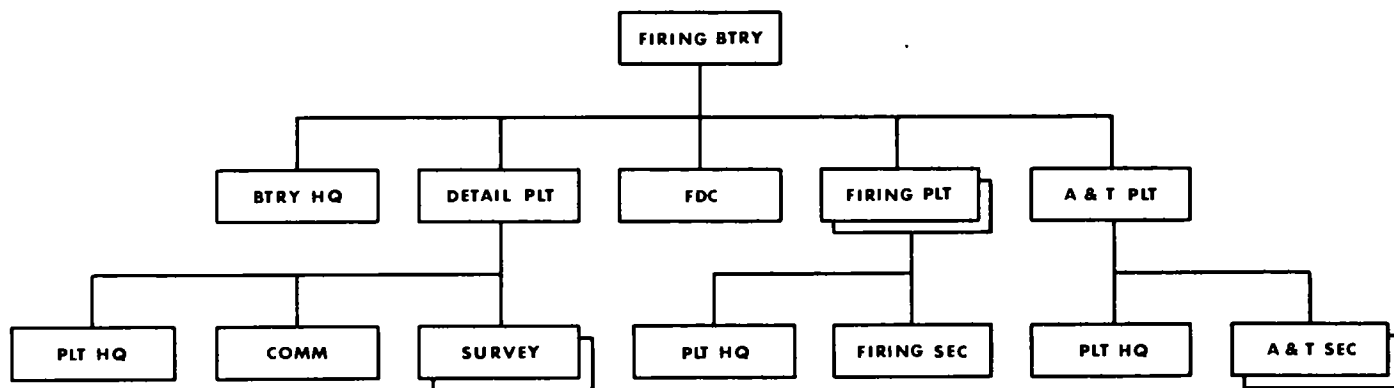


Figure 2-1. Field artillery battery, Lance.

(3) *Launcher specialist.* The launcher specialist performs duties assigned to him by the section chief and those prescribed for him in tables 3-1 through 3-18. He is responsible for all operator maintenance and operations on the monitor-programmer.

(4) *Numbered crewmen.* Launcher crewmen/missilemen perform duties as directed by the section chief and those prescribed in tables 3-1 through 3-18.

c. Assembly and Transport Platoon Headquarters Personnel.

(1) *Platoon leader.* The A&T platoon leader is responsible for the resupply of all battery ammunition and missiles and for missile assembly.

(2) *Platoon sergeant.* The platoon sergeant is the noncommissioned officer in charge of the A&T platoon. He coordinates platoon operations and assists the platoon leader in performing his duties.

(3) *Heavy truck driver.* The heavy truck driver drives the platoon headquarters 5-ton truck, performs operator maintenance on his vehicle, and performs duties as directed by the platoon sergeant.

(4) *Radiotelephone operator (RTO).* The RTO operates and monitors platoon communication equipment and serves as a driver for the platoon leader.

d. Assembly and transport section.

(1) *Section chief.* The section chief is responsible to the platoon leader for—

(a) The training and efficiency of A&T section personnel.

(b) Receiving, storing, transporting, and assembling Lance missiles, off-loading launchers and converting from one launcher configuration

to another, and assisting the firing section in loading the launcher.

(c) Inspection and maintenance of all section equipment.

(d) Observance of safety precautions and decontamination of equipment and materiel within the section.

(e) Preparation of field fortifications for protection of personnel and equipment.

(f) Camouflage, security, and chemical, biological, and radiological (CBR) training and discipline.

(g) Performance of those duties prescribed in tables 3-1 through 3-6 and 3-15 through 3-18.

(2) *Senior assembly specialist.* The senior assembly specialist assists the section chief in performing the duties in (1) above. He performs other duties prescribed by the section chief and may perform duties described in tables 3-1 through 3-5 and 3-15 through 3-18 as a numbered missile handler.

(3) *Heavy truck driver.* The heavy truck driver drives his assigned vehicle, performs operator maintenance on his vehicle, and performs duties as directed by the section chief. He may perform duties described in tables 3-1 through 3-5, and 3-15 through 3-18 as a numbered missile handler.

(4) *Loader-transporter (LT) or wrecker operator.* The LT or wrecker operator performs operator maintenance on the LT or wrecker, performs duties as directed by the section chief, and performs those actions specified for him in tables 3-1 through 3-7 and 3-14 through 3-18.

(5) *Numbered missile handlers.* Missile handlers perform duties as directed by the section chief and those prescribed in tables 3-1 through 3-5 and 3-15 through 3-18.

CHAPTER 3

PROCEDURES FOR ASSEMBLY AND DISASSEMBLY, LOADING AND OFFLOADING, PREPARING FOR ACTION AND TRAVELING, LAUNCHER CONVERSION, AND SYSTEM CHECKOUT

Section I. SECTION DRILL

3-1. General

All platoons and the fire direction center in the firing battery are involved in preparing for action.

a. Survey Section. Battery survey sections extend survey control to the firing positions. This action should be performed prior to emplacement of the launcher at those positions. The sections will follow techniques and procedures specified in FM 6-2, FM 6-42, and the unit standing operating procedures (SOP).

b. Communication Section. The battery communication section installs both wire and radio communications within the battery area as prescribed by unit SOP. FM 6-42(C) describes a type wire net for the battery. The duties of the communication section are discussed in detail in FM 6-10 and FM 6-42.

c. Fire Direction Center. The fire direction center (FDC) computes fire mission data and coordinates the actions of firing platoons and the assembly and transport platoon.

d. Firing Section. The firing section receives a missile from an assembly and transport (A&T) section at the battery area, a hide position, or the firing position; transports it to a firing position (if necessary); prepares it for firing; and fires it.

e. Assembly and Transport Section. The A&T section receives, checks, assembles, stores, and delivers missiles to firing sections.

3-2. Objective

The objective of section drill is to develop maximum proficiency and speed in missile handling and firing procedures through regular training activities.

3-3. Procedures

a. Section drill is conducted in silence, except for commands and reports, and until crew reactions to commands are automatic, immediate, and efficient.

b. Battery officers supervise the drill to insure that maximum efficiency is obtained in complying with instructions.

c. Mistakes must be corrected immediately. Each member of the section must promptly report any mistakes or procedural problems discovered during the drill to the section chief.

d. Duties should be rotated during training so that each member of the section is able to perform all duties within the section.

e. A standard 5-ton wrecker may be used in lieu of the LT for loading and mating operations. The wrecker should be located with the boom pivot post positioned similar to the position depicted for the LT pedestal. The appropriate TM should be consulted for operational procedures and load limits for the wrecker.

3-4. Hand Signals

Hand signals used when directing LT boom, wrecker, or tripod hoist operators are shown in Figure 3-1.



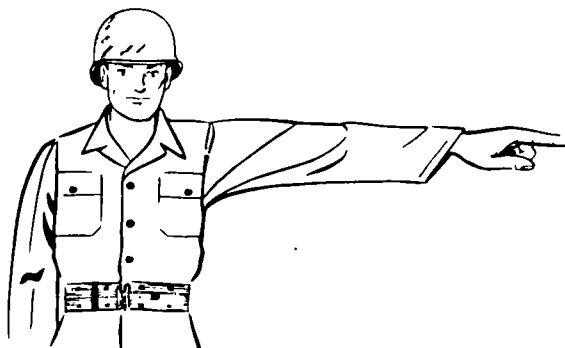
BOOM UP



BOOM DOWN



EXTEND BOOM



SWING BOOM IN DIRECTION POINTED



RETRACT BOOM



WINCH UP



WINCH DOWN



STOP

**NOTE : During blackout operations, a red baton
may be used along with audio directions.**

Figure 3-1. Hand signals for boom, wrecker and tripod hoist operators.

Section II. ASSEMBLY AND DISASSEMBLY

3-5. General

Assembly and disassembly (mating and demating) of the Lance missile are two of the primary functions of the assembly and transport (A&T) section. The firing section is also capable of performing this function when augmented with handling equipment, such as the LT or a wrecker, and an operator for that equipment or the tripod hoist. This operation can be performed in the battery area or in a remote area, and consists of mating/demating warhead sections to/from missile main assemblages in the missile container, SPL, LWL, or the LT utilizing the LT, tripod hoist (with LWL only), or a wrecker.

For additional information on procedures, see TM 9-1425-485-10-2.

3-6. Task Lists

For task lists concerning individual duties during mating operations, see tables 3-1 through 3-4. Demating operations are essentially the reverse of appropriate mating operations, with only minor deviations required. Figures 3-2 through 3-4 illustrate the following: Recommended equipment positioning (fig. 3-2), warhead section removal from container and mating to missile main assemblage (fig. 3-3), and warhead section T-bolt tightening and torquing sequence (fig. 3-4).

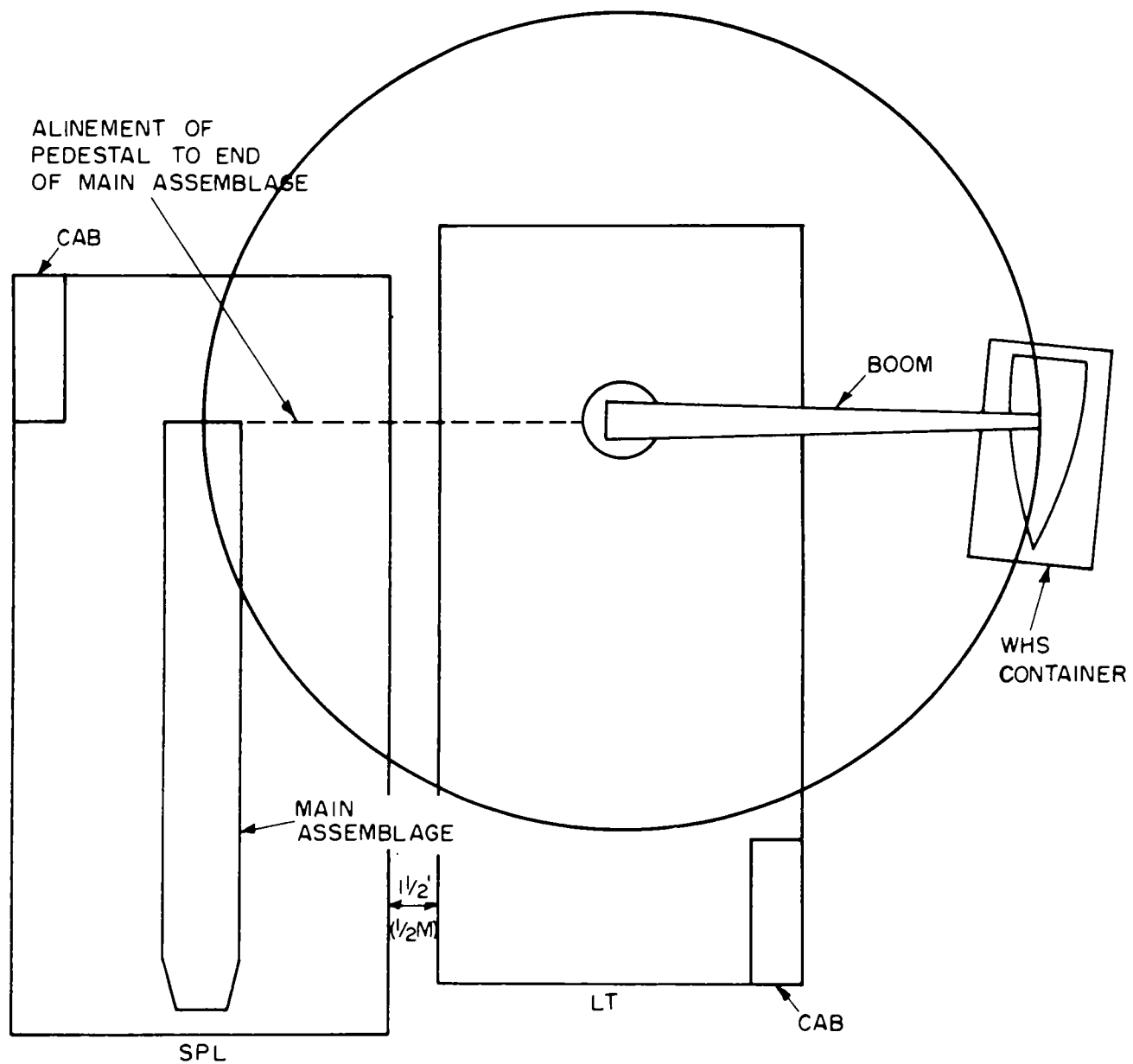
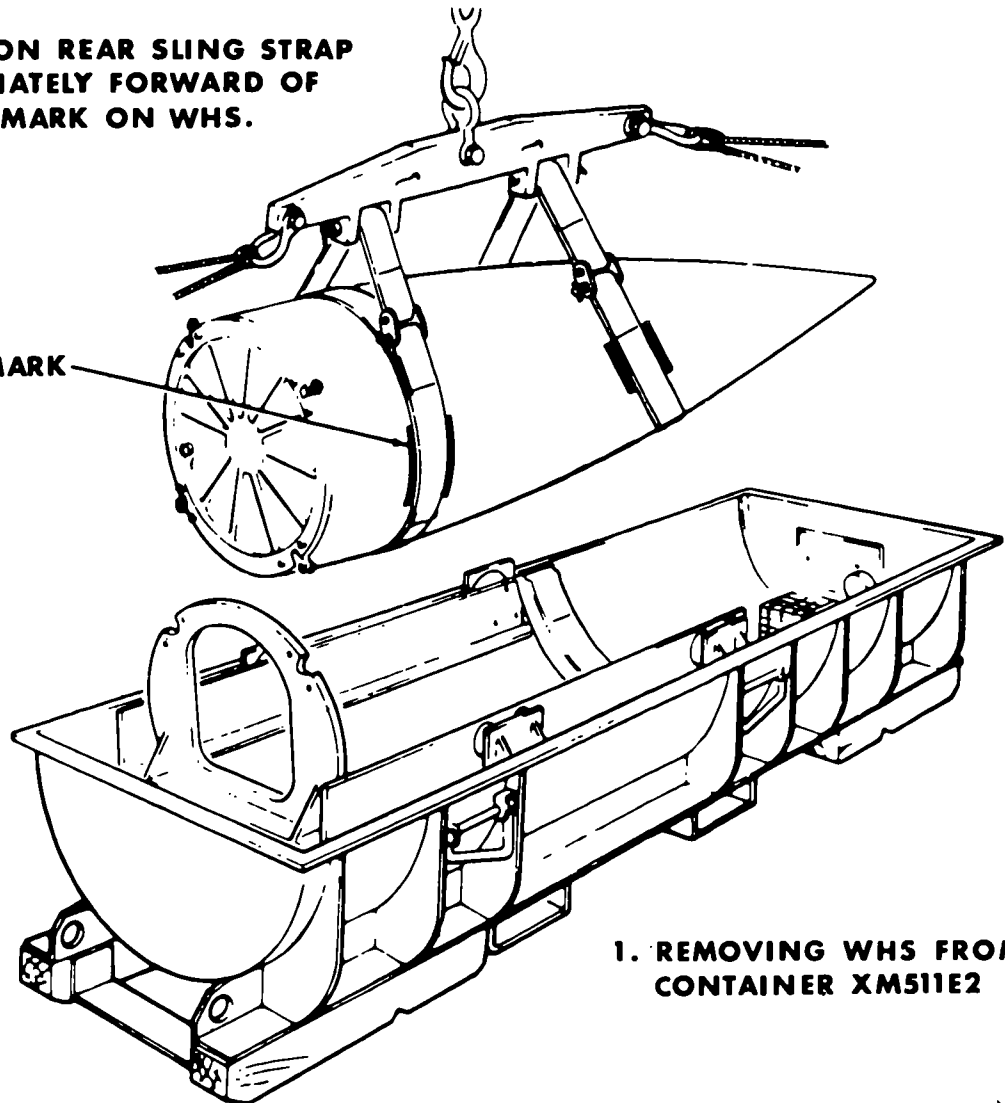


Figure 3-2. Positioning of main assemblage, LT, and WHS for mating.

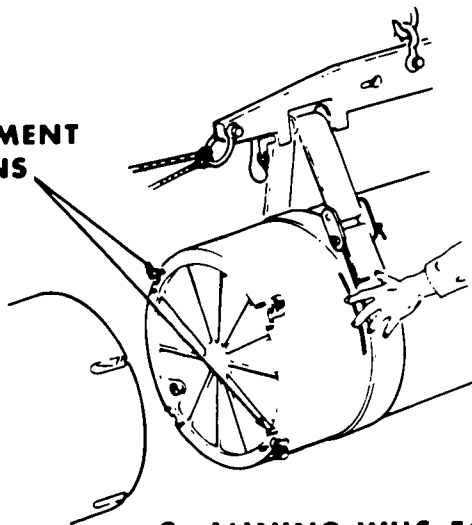
NOTE : POSITION REAR SLING STRAP IMMEDIATELY FORWARD OF STRAP MARK ON WHS.

STRAP MARK

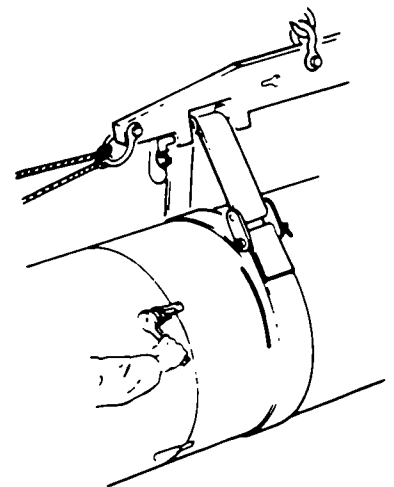


**1. REMOVING WHS FROM
CONTAINER XM511E2**

**ALINEMENT
PINS**

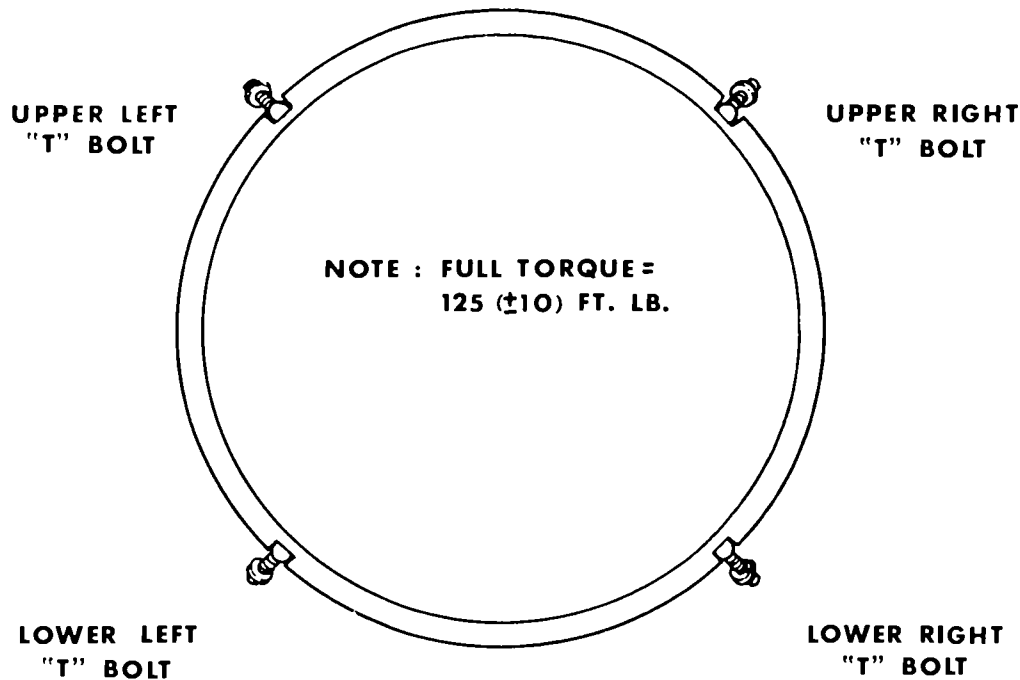


**2. ALINING WHS FOR MATING
WITH MAIN ASSEMBLAGE**



**3. SECURING WHS TO
MAIN ASSEMBLAGE**

Figure 3-3. Lifting WHS from container and mating WHS with main assemblage.



TIGHTENING SEQUENCE

1. UPPER RIGHT "T" BOLT
2. UPPER LEFT "T" BOLT
3. LOWER LEFT "T" BOLT
4. LOWER RIGHT "T" BOLT

TORQUING SEQUENCE

1. UPPER LEFT "T" BOLT
2. LOWER RIGHT "T" BOLT
3. UPPER RIGHT "T" BOLT
4. LOWER LEFT "T" BOLT

Figure 3-4. WHS T-bolt tightening and torquing sequence.

Section III. LOADING AND OFF-LOADING

3-7. General

This section outlines procedures to be followed when loading and off-loading missiles or main assemblages on the SPL, LWL, or LT utilizing the LT, tripod hoist (with LWL only) or a wrecker. Loading and off-loading missiles on the SPL and LWL are responsibilities of the firing section. Primary responsibility for loading and off-loading missiles and main assemblages on the LT and 5-ton resupply vehicle belongs to the assembly and transport section. For addi-

tional information on loading and off-loading procedures, see TM 9-1425-485-10-2.

3-8. Task Lists

For task lists concerning individual duties during loading operations, see tables 3-5 through 3-7. Off-loading operations are essentially the reverse of appropriate loading operations, with only minor deviations required. Figures 3-5 through 3-7 illustrate recommended equipment positions for loading and off-loading operations. The equipment should be emplaced in the following sequence: Missile, LT, and SPL.

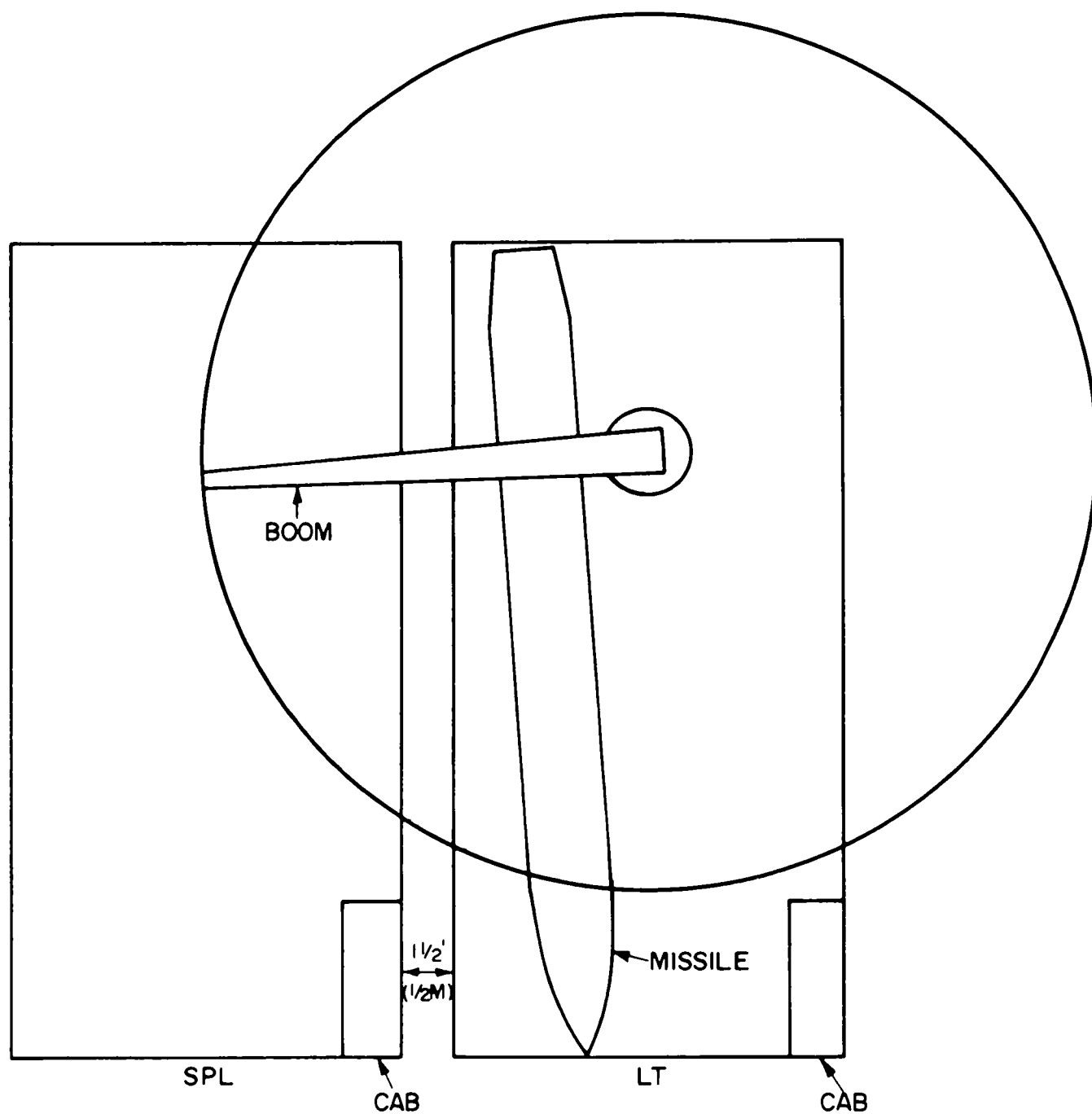


Figure 3-5. Position of SPL (LWL) and LT for loading from LT.

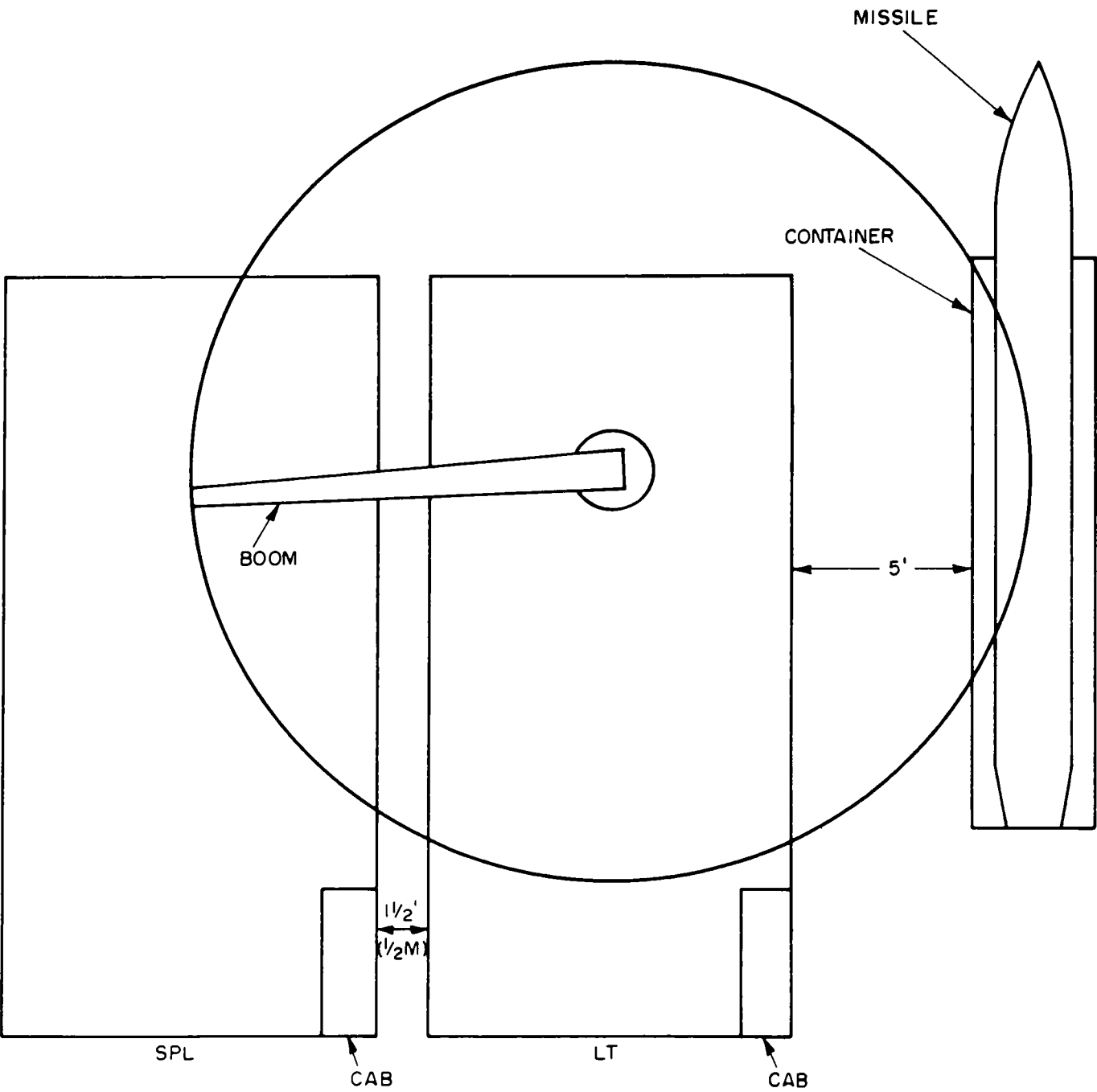


Figure 3-6. Position of SPL (LWL), LT, and container for loading from container.

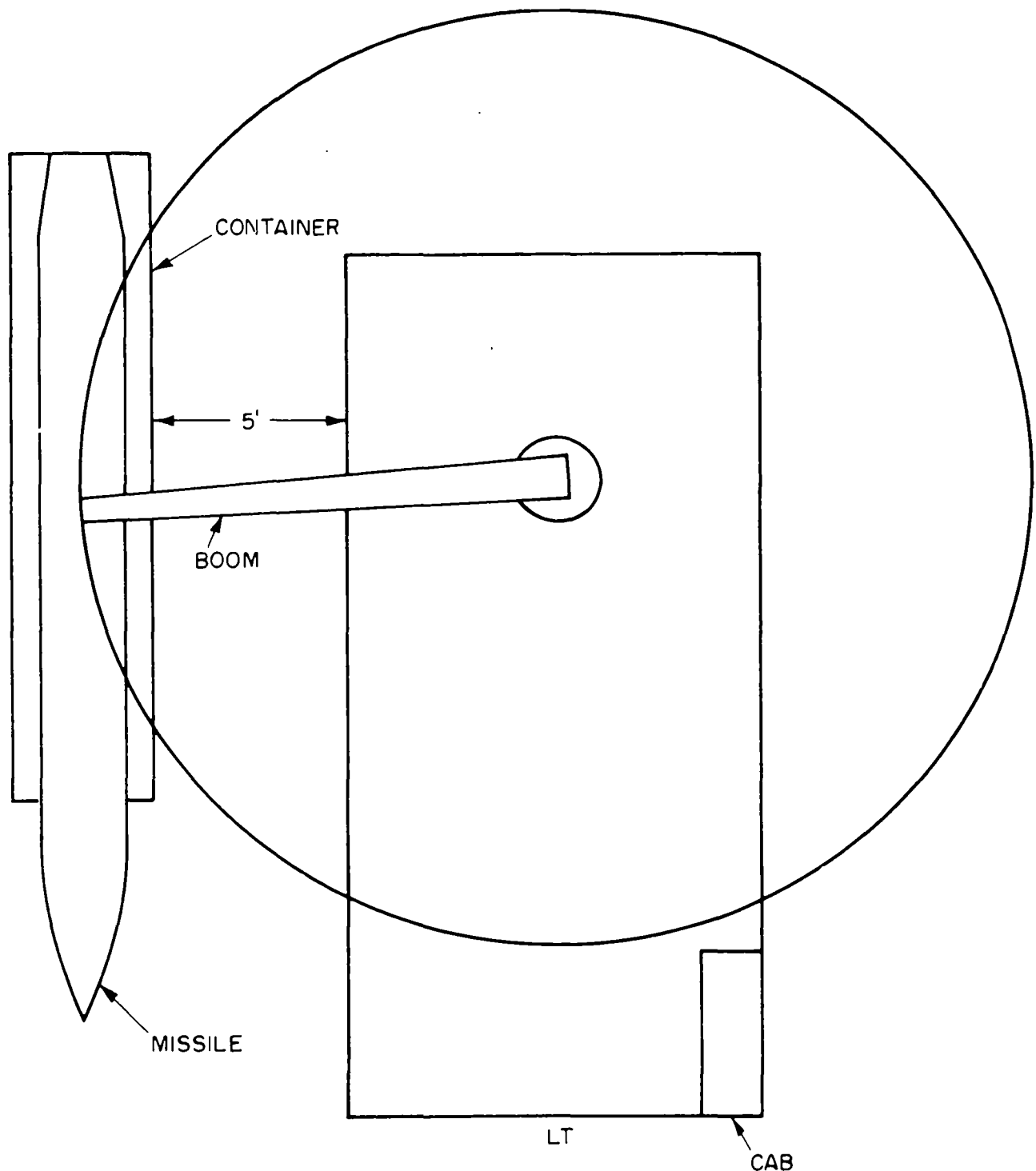


Figure 3-7. Position of LT and container for loading LT from container.

Section IV. PREPARING FOR ACTION AND TRAVELING

3-9. General

a. Preparing for action and firing of the Lance missile is the primary function of the firing section. This operation is performed at a surveyed firing point, which is normally located

in an area remote from the firing battery position area. An advance party will normally occupy the firing point prior to launcher arrival to establish security and communications, emplace the remote theodolite and target set on

the orienting line, and emplace a guide tape or stakes in the direction of fire for launcher alignment.

b. This section contains the procedures for preparing for action and firing the Lance missile from the SPL and LWL under normal and traverse limited conditions, multiround (rate-of-fire) missions, and for equipment march order. For additional information on procedures, see TM 9-1425-485-10-2.

3-10. Task Lists

a. For task lists concerning individual duties during emplacement, through march order, see tables 3-8 through 3-13. Figure 3-8 illustrates firing position arrangement, figure 3-9, missile boresight, figure 3-10, sighting and laying scheme and figure 3-11, control surface (fin) installation and removal. For task lists concerning individual duties during multiround (rate-of-fire) missions, see table 3-18.

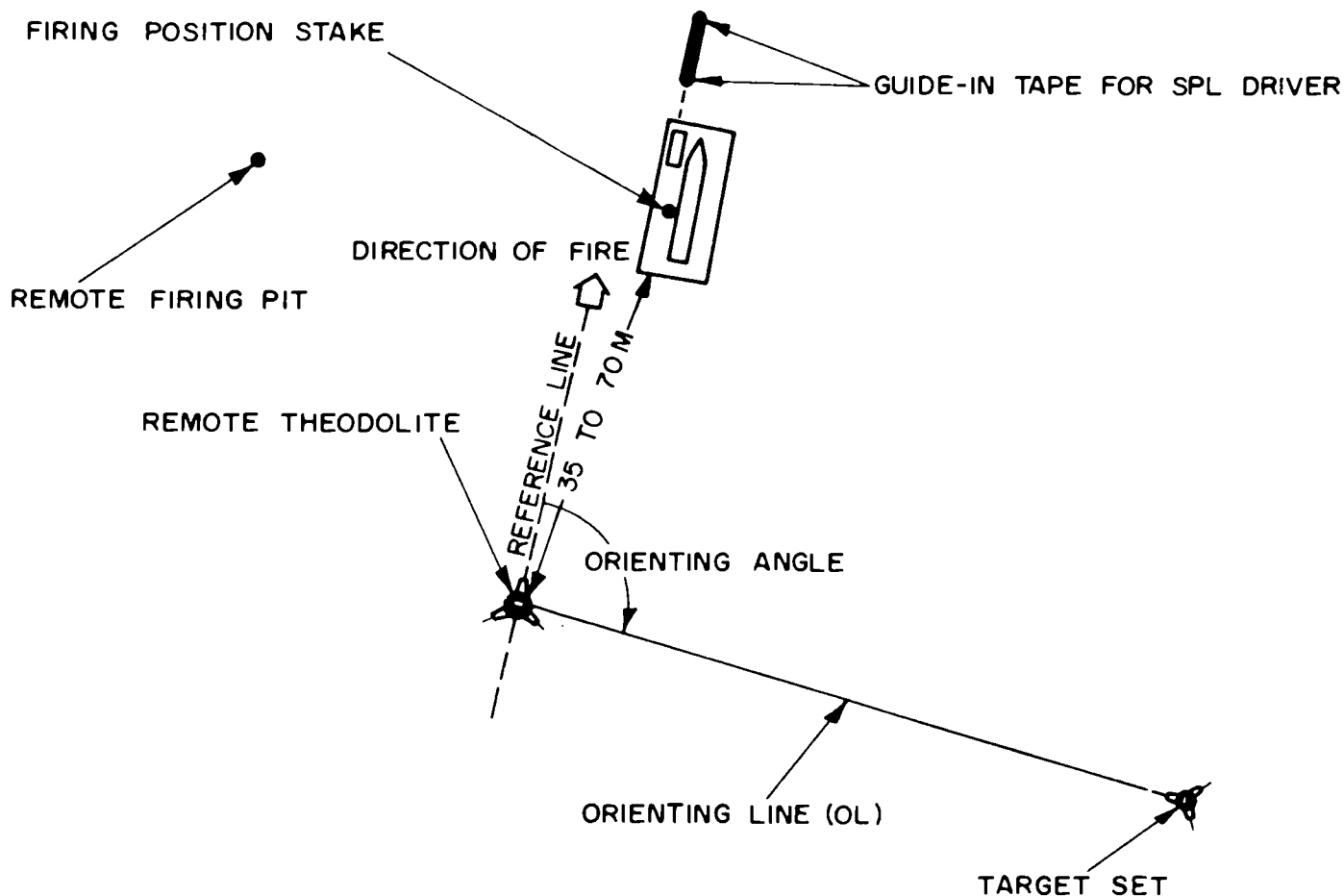
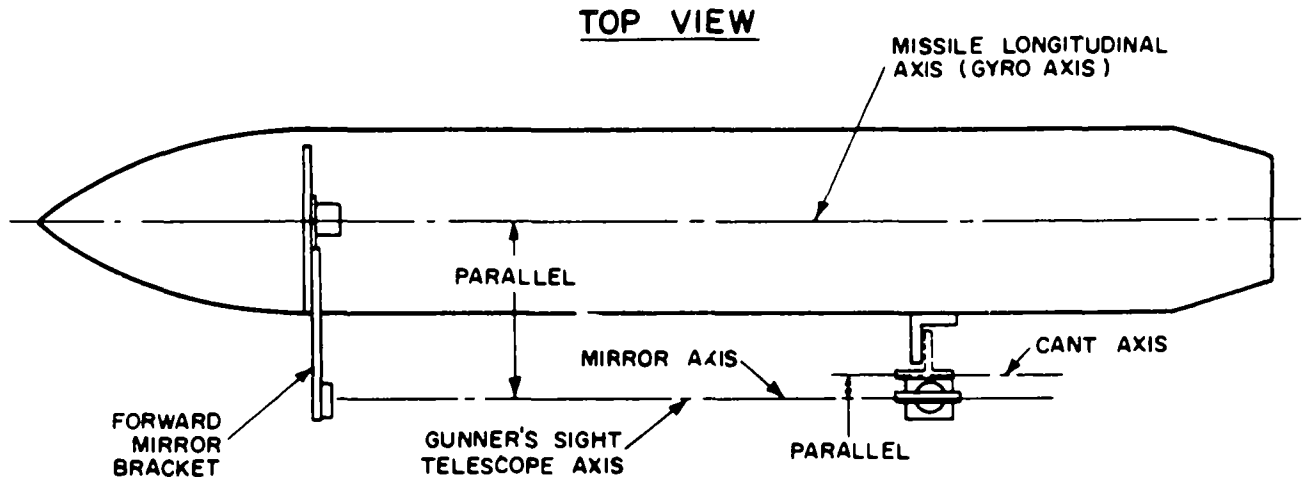


Figure 3-8. Firing position arrangement.



SIGHT UNIT TELESCOPE ESTABLISHED PARALLEL TO CANT AXIS BY ADJUSTING TELESCOPE UNTIL AUTOCOLLIMATED ON CANT MIRROR

SIGHT UNIT TELESCOPE ESTABLISHED PARALLEL TO GYRO AXIS BY ADJUSTING REAR BRACKET UNTIL TELESCOPE IS AUTOCOLLIMATED ON FORWARD MIRROR.

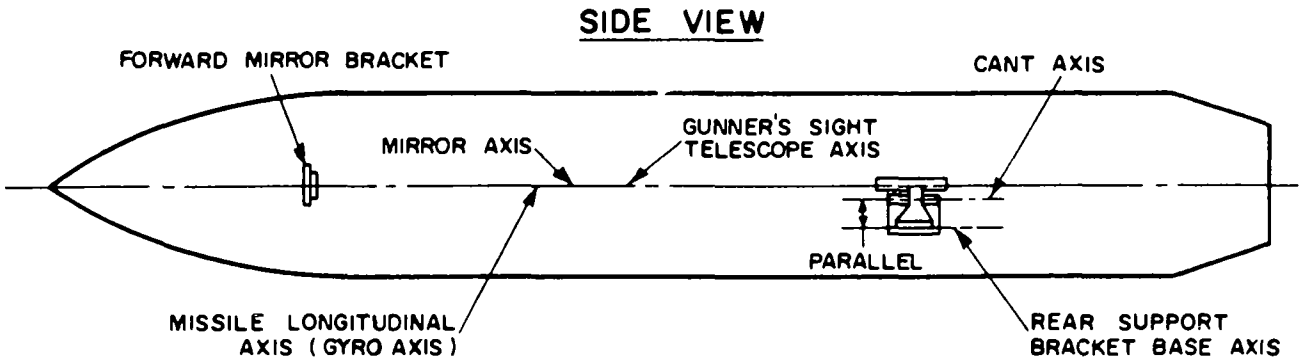


Figure 3-9. Lance missile in boresighted condition.

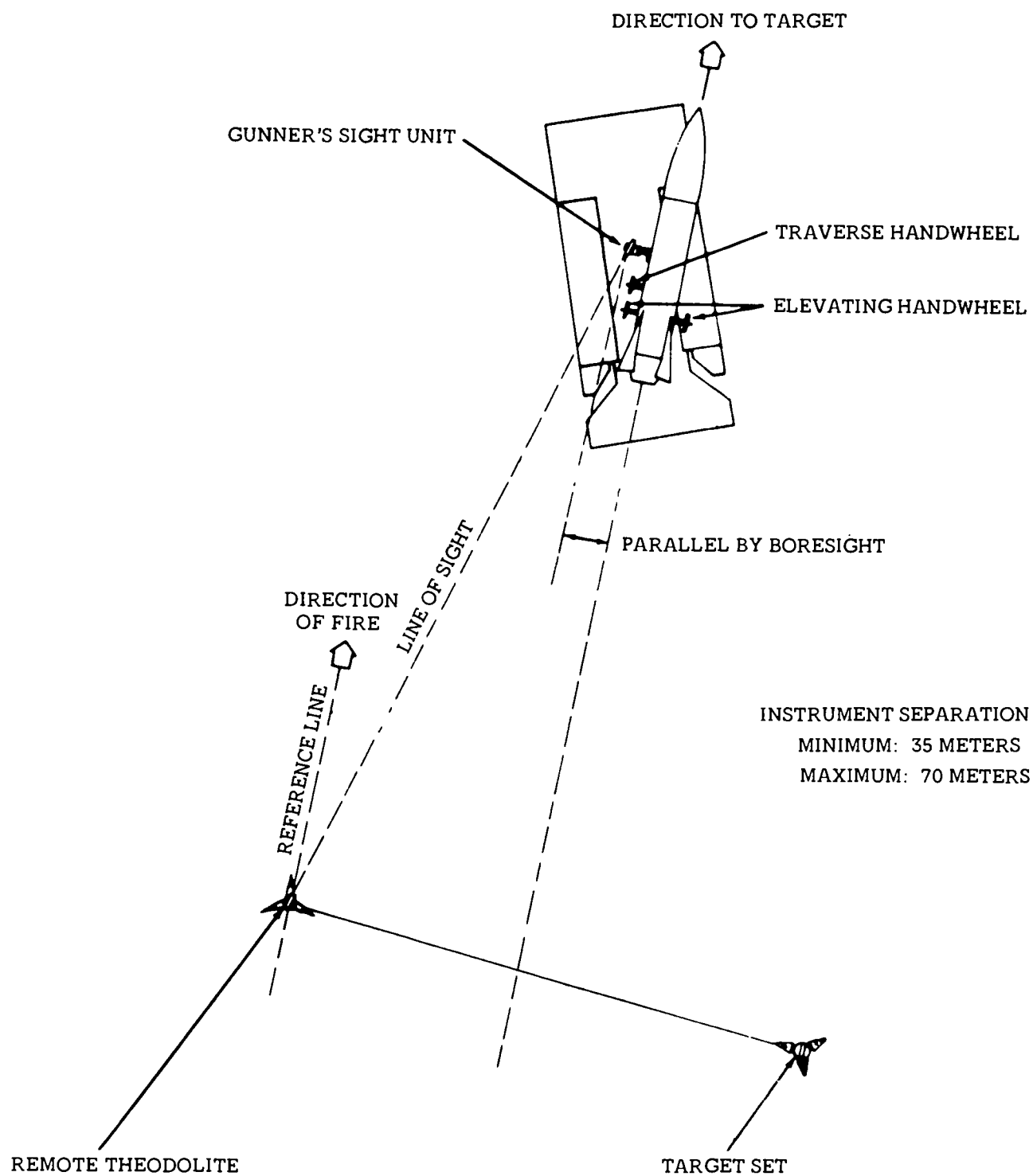


Figure 3-10. Sighting and laying scheme.

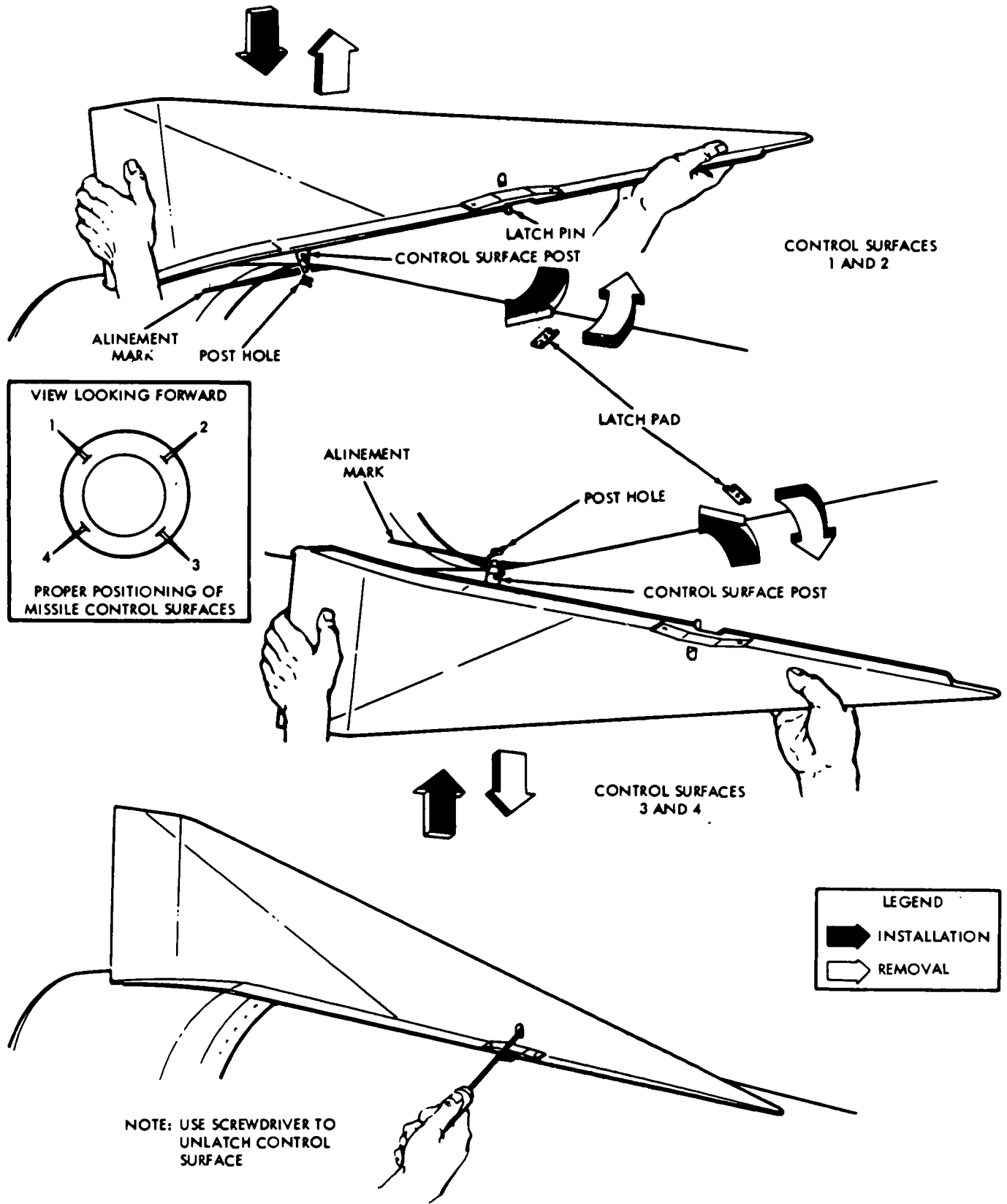


Figure 3-11. Control surface installation and removal.

b. Tables 3-15 and 3-16 prescribe tasks involved in tripod hoist set-up and march order. Although written for the firing section they can

be utilized by the assembly and transport section with only minor modification.

Section V. SYSTEM CHECKOUT

3-11. General

The system checkout as described in TM 9-1425-485-10-2 should be performed prior to occupation of a firing position, time permitting, and daily if a mated missile is on the launcher.

3-12. Warhead Section Prefire Checkout

Refer to TM 9-1115-485-12 (C-NOFORN), Operations and Organizational Maintenance (Pre-launch Procedures) XM 234 Atomic Warhead Section, XM 240 Training Atomic Warhead Section (U) for warhead sections prefire checkout procedures.

Section VI. LAUNCHER CONVERSION

3-13. General

Conversion from one launcher configuration to another is a function of the A&T platoon. For additional information on conversion procedures, see TM 9-1425-485-10-2.

3-14. Task Lists

For task lists concerning individual duties during conversion from the LWL to SPL configuration, see table 3-14A and for conversion from SPL to LWL configuration see table 3-14B. Figures 3-12 and 3-13 illustrate recommended equipment arrangements for conversion.

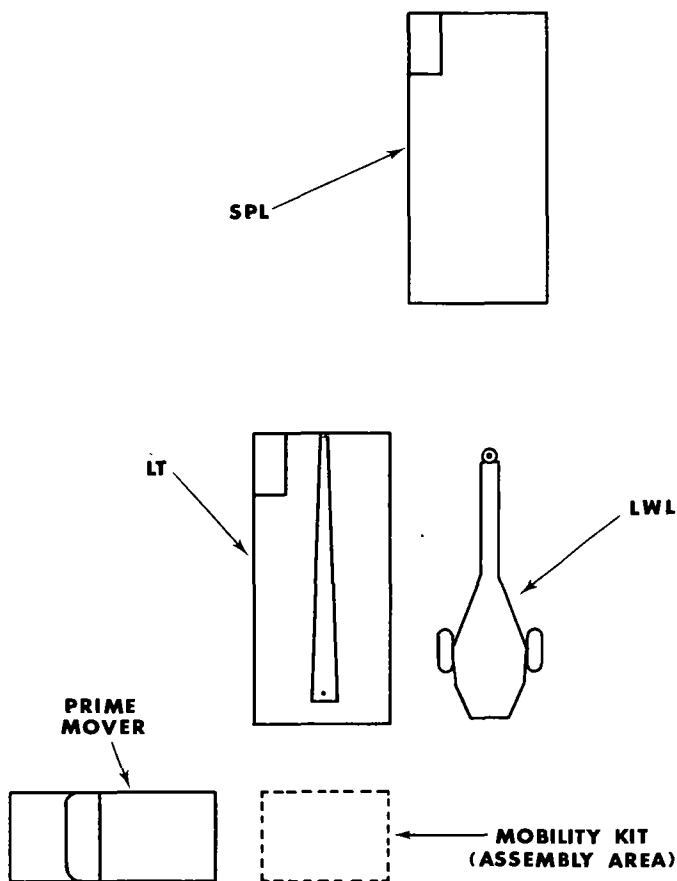


Figure 3-12. Equipment positioning for conversion, LWL to SPL.

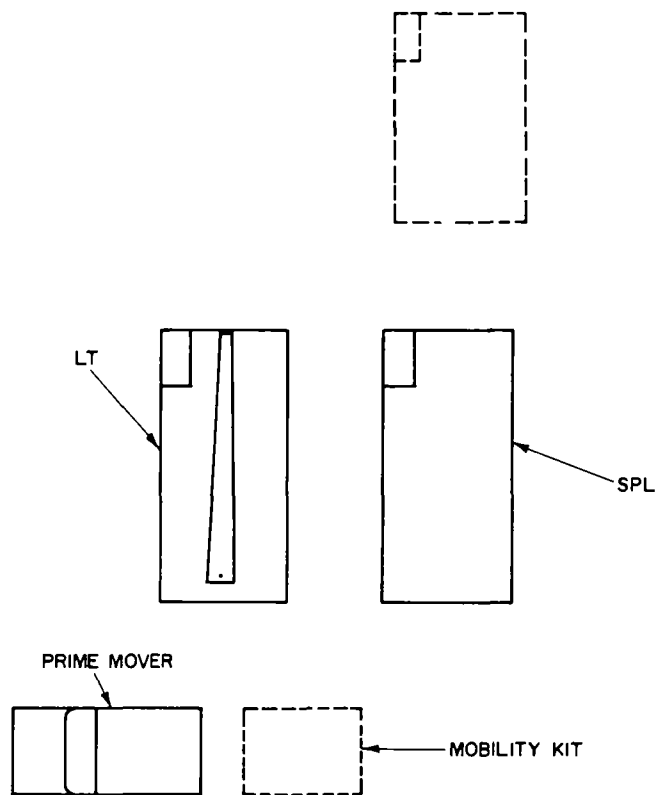


Figure 3-13. Equipment positioning for conversion, SPL to LWL.

Table 3-1. Mating of WHS to MMA in Container Using LT

Step	C/S	LT operator	#1	#2	#3	#4
1	Position vehicle	Halt LT when directed by C/S. Engage PTO and SLO, set engine speed at 1500 rpm.	On the left front, remove front covers and bows. Stow on LT.	One the right front, remove rear covers and bows. Stow on LT.	On the left rear, remove rear covers and bows. Stow on LT.	On the right rear, remove rear covers and bows. Stow on LT.
2	Lower LT tailgate, direct LT operator.	Raise boom from stowed position and on direction of C/S, lower hoist cable to disengage hook from stowed position.	Lower LT tailgate. Prepare tools and place by container.	Remove sling from stowed position and attach to boom hook.	Insure MMA securing straps are clear of cradles.	

Caution: Equalize pressure before removing container cover

3	Check leak and humidity indicator, direct pressure release.		Depress buttons on pressure equalizing valve on order of C/S.			
4	Designate area for container cover.		On left front of container, release T-bolts.	On right front of container, release T-bolts.	Remove access cover. Prepare cables and attach to container. Secure guide ropes and attach to sling.	
5	Direct positioning of sling over container cover.	Operate boom controls on direction of C/S to position sling over container cover.	At left front of container,	At right front of container,	At left rear of container,	At right rear of container,
6	Insure cables are correctly positioned and that boom hook is over the marked CG. Then signal LT operator to take up slack in sling cables. Direct removal of container cover.	Take up slack in sling cables as directed by C/S and raise container cover sufficiently to clear missile. Place container cover as directed by the C/S.	Guide container cover as directed by C/S.			
7			Disconnect cables from sling and attach lifting straps to sling.			

Note. Perform steps 8 through 10 only if missile round is to be transported in the container, otherwise, proceed to step 11.

8	Direct removal of saddle support assembly from stowed position in MMA container to position under front missile cradle in MMA container.		Remove the quick release pins.	Remove the support assembly bolts.		
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Step	C/S	LT operator	#1	#2	#3	#4
9			Slide saddle support assembly under front missile cradle so that bolt holes in saddle support assembly are aligned with bolt holes in fwd msl cradle.			
10			Reinsert quick release pins.	Reinsert bolts attaching front support assembly to forward msl cradle and tighten.		

Caution: Vent WHS container before opening

11	Inspect WHS container. Designate area for WHS container cover and direct LT operator.	Operate boom controls on direction of C/S to position sling over container cover.	Vent WHS container and remove shipping cover from MMA.	Assist #1. Remove shipping cover.	On the left -----	On the right. Release container T-bolts.
12	Direct removal of WHS container cover. Insure cover is raised sufficiently to clear WHS. Inspect WHS. (See appropriate WHS TM).		At left front,	At right front,	At left rear,	At right rear, remove WHS container cover and place in area designated by C/S.
13	Direct positioning of sling over WHS.	On directions from C/S, operate boom to position sling over WHS.	Insure that sling straps and/or beam do not strike WHS.			
14	Insure sling straps are correctly positioned and that boom hook is over WHS. Signal LT operator to take up slack in sling straps.	Take up slack in sling straps on directions from C/S.	Fit sling straps around WHS between marks.			
15	Remove PAL connector from WHS and place on dummy coupling. Direct release of T-bolts		Disconnect fwd WHS container strap and swing clear of WHS		Release upper and lower WHS T-bolts and swing clear of mounting on order of C/S.	

16	Direct LT operator to position WHS 5 inches away from fwd end of MMA.	Position WHS on direction of C/S.	At left front,	At right front,	At left rear,	At right rear,
17	Supervise repositioning of personnel.		steady WHS with guide ropes.			
18	Direct LT operator to position WHS level with and 4 inches away from fwd end of MMA.		At left front,	At right front,	At left rear,	At right rear,
			steady WHS with guide ropes.			

Caution: A block of wood must be inserted between the MMA and WHS before J1/P1 can be connected

19	Direct #1 and #2 to steady WHS. Direct #4 to insert block between MMA and WHS. When block is inserted, direct #3 to connect P1 to J1, verify connection.		At left front,	At right front,	When directed by C/S, connect P1 to J1.	Insert a block of wood between the WHS and MMA.
			steady WHS.			
20	Direct removal of block from between WHS and MMA.				Insure necessary tools are properly positioned for assembly.	On orders from C/S, remove block of wood from between WHS and MMA.
21	Direct positioning of WHS for assembly and attachment of WHS to MMA.	Operate boom controls on direction of C/S.			Attach and tighten top left followed by bottom left WHS bolts.	Attach and tighten top right followed by bottom right WHS bolts.
22	Direct torquing of WHS bolts.				Torque top left WHS bolt. Pass wrench to #4. Upon receipt of wrench from #4 torque bottom left bolt.	Torque bottom right followed by top right bolts. Pass wrench to #3.

Caution: Sling and straps must be repositioned over proper strap marks before missile can be raised

23	Direct removal of sling straps.		Remove sling straps.			
24	Direct LT operator to position boom to center of stowed position insuring sling clears LT.	Position boom on direction of C/S.	Mount LT left side ---	Mount LT right side ---	Steady sling on left side. Pass to #1.	Steady sling on right side. Pass to #2.

Step	C/S	LT operator	#1	#2	#3	#4
25	Direct LT operator to position sling for removal and storage.	Position sling on direction of C/S.	Remove sling from boom hook and stow.		Raise tailgate left side and secure if required.	Raise tailgate right side and secure if required.
26	Direct LT operator to stow boom.	Stow boom.				
27	Direct LT operator to reduce engine speed to idle, disengage SLO & PTO if not required for further operations.	Reduce engine speed to idle, disengage SLO and PTO, switch off engine.	Replace WHS container cover.			
28	Supervise securing of WHS container cover.				Secure WHS left side container bolts.	Secure WHS right side container bolts.
29	Supervise and assist in replacement of MMA container cover.	Replace MMA container cover.				
30			Secure MMA container left side T-bolts and torque.	Secure MMA container right side T-bolts and torque.	Secure access cover bolts.	

Table 3-2. Mating of WHS to MMA on LT Using LT

Step	C/S	LT operator	#1	#2	#3	#4
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Note. This mating operation begins with an MMA on the LT. Procedures for transferring an MMA from the container to the LT are contained in table 3-5.

Caution. Vent WHS container before opening

1	Inspect WHS container. Designate area for WHS container cover and direct LT operator.	Operate boom controls on direction of C/S to position sling over container cover.	Vent WHS container and remove shipping cover from MMA.	Assist #1. Remove whipping cover.	On the left of container, disengage container T-bolts.	On the right of container, disengage container T-bolts.
2	Direct removal of WHS container cover. Insure cover is raised sufficiently to clear WHS. Inspect WHS. (See appropriate WHS TM).		At left front,	At right front.	At left rear,	At right rear,
			remove WHS container cover and place in area designated by C/S.			
3	Direct positioning of sling over WHS.	On directions from C/S, operate boom to position sling over WHS.	Insure that sling straps and/or beam do not strike WHS.			

4	Insure sling straps are correctly positioned and that boom hook is over WHS. Signal LT operator to take up slack in sling straps.	Take up slack in sling straps on directions from C/S.	Fit sling straps around WHS at marked points.			
5	Remove PAL connector from WHS and place on dummy coupling. Direct release of T-bolts.		Disconnect fwd WHS container strap and swing clear of WHS.	Release upper and lower WHS T-bolts and swing clear of mounting on order of C/S.		
6	Direct LT operator to position WHS 5 inches away from fwd end of MMA.	Position WHS on direction of C/S.	Hand rope to #3 and mount LT left side.	Hand rope to #4 and mount LT right side.	Receive rope from #1 and steady DHS.	Receive rope from #2 and steady WHS.
7	Supervise repositioning of personnel.		Receive ropes from #3 and steady WHS.	Receive ropes from #4 and steady WHS.	Hand ropes to #1 and steady WHS.	Hand ropes to #2 and steady WHS.
8	Direct LT operator to position WHS level with and 4 inches away from fwd end of MMA.		At left front,	At right front	At left rear,	At right rear,
steady WHS with guide ropes during transfer.						
Caution: A block of wood must be inserted between the MMA and WHS before J1/P1 can be connected						
9	Direct #1 and #2 to steady WHS. Direct #4 to insert block between MMA and WHS. When block is inserted, direct #3 to connect P1 to J1. Verify P1 connection.		At left front,	At right front,	When directed by C/S connect P1 to J1.	Insert a block of wood between the WHS and MMA.
			steady WHS.			
10	Direct removal of block from between WHS and MMA.				Insure necessary tools are properly positioned for assembly.	On orders from C/S, remove block of wood from between WHS & MMA.
11	Direct positioning of WHS for assembly and attachment of WHS to MMA.	Operate boom controls on direction of C/S.			Attach and tighten top left followed by bottom left WHS bolts.	Attach and tighten top right followed by bottom right WHS bolts.
12	Direct torquing of WHS bolts.				Torque top left WHS bolt. Pass wrench to #4. Upon receipt of wrench from #4 torque bottom left bolt.	Torque bottom right followed by top right bolts. Pass wrench to #3.

Step	C/S	LT operator	#1	#2	#3	#4
Caution: Sling and straps must be repositioned over proper strap marks before missile can be raised						
13	Direct repositioning of sling.	Operate boom at direction of C/S.	Reposition straps.			
14	Direct LT Operator to raise missile sufficiently to enable the spacer to be removed.	Raise missile on direction of C/S.	Steady missile.		Remove the spacer and stow.	
15	Direct LT Operator to lower the missile onto supports.	Lower missile onto supports on direction of C/S.	Steady and guide missile onto supports.			
16	Direct fitting of securing straps.		Fit WHS securing strap.	Assist #1 in fitting WHS securing straps.	Fit fwd MMA securing strap.	Assist #3 fit fwd MMA securing strap.
17	Direct removal of sling straps.	Remove sling straps.				
18	Direct LT operator to position boom to center of stowed position insuring sling clears LT.	Position boom on direction of C/S.	Mount LT left side.	Mount LT on right side.	Steady sling on left side. Pass to #1.	Steady sling on right side. Pass to #2.
19	Direct LT operator to position sling for removal and storage.	Position sling on direction of C/S.	Remove sling from boom hook and stow.		Raise tailgate left side and secure if required.	Raise tailgate right side and secure if required.
20	Direct LT operator to stow boom. Direct replacement of WHS restraining strap.	Stow boom.	Replace WHS restraining strap in container.			
21	Direct LT operator to reduce engine speed to idle, disengage SLO & PTO if not required for further operations.	Reduce engine speed to idle, disengage SLO & PTO, switch off engine.	Replace WHS container cover.			
22	Direct replacement of upper supports in MMA. Supervise securing of WHS container cover.		Replace upper supports in the MMA container.		Secure & torque WHS left side container bolts.	Secure & torque WHS right side container bolts.
23	Supervise and assist in replacement of MMA container cover.		Replace MMA container cover.			
24			Secure MMA container left side T-bolts and torque.	Secure MMA container left side T-bolts and torque.	Secure access cover bolts.	

Table 3-3 Mating of WHS to MMA on SPL Using LT

Step	C/S	LT operator	#1	#2	#3	#4
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Note. This mating operation begins with an MMA on the SPL, SPL covers and bows removed, and tailgate lowered.

Caution: Do not move SPL loaded with MMA only

1	Guide LT into position (1). Direct lowering of tailgate.	Halt when directed by C/S. Engage PTO, SLO, and set engine at 1500 rpm.	On left front, remove front covers and bows. Stow on front of LT.	At right front,	On left rear, remove rear covers and bows and stow on front of LT. Lower tailgate on direction of C/S.	On right rear,
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Note: SPL driver remove launch truss lock-pin, and elevate launch truss approximately 20 mls.

Caution: WHS container cover must be vented before container T-Bolts are disengaged

2	Inspect WHS container. Designate area for WHS container cover and direct LT operator.	Raise boom and on signal from C/S, lower hoist cable to disengage hook from stowed position.	Vent WHS container and remove shipping cover from MMA.	Release hook from stowed position.		
3	Direct releasing of container T-bolts.				On left of container, release container T-bolts.	On right of container,
4	Direct LT operator to lower hook to enable #2 to engage sling in hook.	Lower hook on direction of C/S.	Prepare tools for msl. assembly and place at rear of WHS container.	Remove sling from stowed position and attach to boom hook. Attach 2 guide ropes to each of sling (2).		
5	Direct removal of WHS container cover. Insure cover is raised sufficiently to clear WHS. Inspect WHS.		At left front,	At right front,	At left rear,	At left rear,
			remove WHS container cover and place in area designated by C/S.			
6	Direct position of sling over WHS. Insure sling straps are correctly positioned and that boom hook is over WHS.	On directions from C/S, operate boom to position sling over WHS.	Insure that sling straps and/or beam do not strike WHS. Fit sling straps around WHS at marked points.			
7	Signal LT operator to take up slack in sling straps. Remove PAL connector from WHS and place on dummy coupling.	Take up slack in sling straps on directions from C/S.	Disconnect fwd WHS container strap and swing clear of WHS.		Release upper and lower WHS T-bolts and swing clear of mounting.	

Step	C/S	LT operator	#1	#2	#3	#4
8	Direct LT operator to position WHS 4 inches away from fwd end of MMA.	Position WHS on direction of C/S.	Hand rope to #3 and mount LT left side.	Hand rope to #4 and mount LT right side.	Receive rope from #1 and steady WHS.	Receive rope from #2 and steady WHS.
9	Supervise repositioning of personnel.	Position WHS on direction of C/S.	Receive ropes from #3 and steady WHS. At left front,	Receive ropes from #4 and steady WHS. At right front, steady WHS with guide ropes during transfer.	Hand ropes to #1 and steady WHS. At left rear,	Hand ropes to #2 and steady WHS. At right rear,

Caution: Block of wood must be inserted between MMA and WHS before J1/P1 can be connected

10	Direct #1 and #2 to STEADY WHS. Direct #4 to insert block between MMA and WHS. When block is inserted, direct #3 to connect P1 J1. Verify P1 connection.		Steady WHS.		When directed by C/S, connect P1 to J1.	Insert a block of wood between the WHS and MMA.
11	Direct removal of block from between WHS and MMA.				Insure necessary tools are properly positioned for assembly.	On orders from C/S, remove block of wood from between WHS and MMA.
12	Direct positioning of WHS for assembly.	Operate boom controls on direction of C.S.				
13	Direct tightening of WHS bolts.				Attach and tighten top left followed by bottom left WHS bolts.	Attach and tighten top right followed by bottom right WHS bolts.
14	Direct torquing of WHS bolts.				Torque top left WHS bolt. Pass wrench to #4. Upon receipt of wrench from #4 torque bottom left bolt.	Torque bottom right followed by top right bolts. Pass wrench to #3.
15			At left front,	At right front, remove sling straps from WHS.	At left rear,	At right rear,
16	Direct fitting of WHS securing straps.		Mount LT.		Fit WHS securing straps.	
17	Direct LT operator to position boom to center of stowed position insuring sling clears LT.	Position boom on direction of C/S.			Obtain two left side guide ropes and steady sling. Pass to #1.	Obtain two right side guide ropes and steady sling. Pass to #2.

18	Direct LT operator to lower sling for removal and storage.	Position sling on direction of C/S.	Remove sling from boom hook and stow.	At left side, raise tailgate on LT and SPL, if required.	On right side,
19	Supervise securing of WHS container. Direct LT operator to reduce engine speed, disengage SLO and PTO, if not required, for further operations.	Reduce engine speed to idle. Disengage PTO and SLO, switch off engine.	Install cover on WHS container.		
20			Secure and torque all WHS container T-bolts.		
21			Secure all tools.		

Table 3-4 Mating of WHS To MMA on LWL Using Tripod Hoist

Step	C/S	TH OP	#1	#2	#3	#4
1	Refer to table 3-15 to erect tripod hoist.					
2	Inspect WHS container, designate area for WHS container cover and direct TH operator.	Obtain tools	Vent WHS container and remove shipping cover from MMA.	Prepare sling and straps for tripod hoist operation. Attach guide ropes.		
3	Direct release of container T-bolts.				On left of container, release T-bolts.	On right of container, release T-bolts.
4	Direct removal of WHS container cover and insure that cover is raised sufficiently to clear WHS. Inspect WHS.	Assist in inspecting WHS.	At left front,	At right front,	At left rear,	At right rear,
			remove WHS container cover and place in designated area.			
5	Direct attachment of sling assembly lifting shackle to hoist hook.	Lower hoist hook sufficiently to attach sling assembly lifting shackle.				
6			Attach sling assembly on strap marks.			
7	Direct sling over WHS.	Lower cable over WHS.				
8	Direct positioning of sling strap on WHS.		Attach front sling strap.		Attach rear sling strap.	
9	Direct removal of WHS tiedown strap and remove test cable from WHS.		Remove WHS tiedown strap.			

Step	C/S	TH OP	#1	#2	#3	#4
10	Direct TH OP to take up slack in sling strap.	Take up slack in sling strap.				
11	Direct release of WHS T-bolts and verify that they are free of cradle assembly.				Release upper two T-bolts. Release lower two T-bolts.	
12	Direct lifting of WHS from WHS container and inspect WHS.	Operate hoist cable and lift WHS from container.				

Caution: Do not damage TH stabilizing cables when moving WHS container

13	Direct removal of WHS container and assist 1, 2, 3, 4.	Steady WHS with guide rope.	Move WHS container from under WHS and tripod hoist.			
14	Direct emplacement of LWL under tripod hoist.	Remove shipping cover from MMA.	At left front,	At right front,	At left rear,	At right rear,
			position LWL as directed by C/S.			
15					Set left hand brake.	Set right hand brake.
16	Direct removal of launch truss lockup elevation of launch truss to approximately 20 mils.		Remove launch truss lockpin.	Disengage forward support lockpin.	Elevate launch truss to approximately 20 mils.	
17	Direct lowering of front stabilizing jacks.			Lower left front stabilizing jack.		Lower right front stabilizing jack.
18	Insure WHS T-bolts are swung out. Direct TH OP to align WHS with MMA.	Operate hoist cable to align WHS with MMA.	Steady WHS with guide ropes.			
19	Direct positioning of LWL so that MMA is approximately 4 inches from WHS (if necessary).	Steady WHS.	Reposition LWL as directed by C/S (if necessary).			

Caution: A block of wood must be inserted between MMA and WHS before J1/P1 can be connected

20	Inspect connectors P1 and J1 and order connection of P1/J1 after block of wood has been inserted between WHS and MMA.		Steady WHS.	Connect J1 to P1 -----	Insert block of wood.
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21	Direct removal of block of wood.					Remove block of wood.
22	Direct positioning of WHS for assembly and attachment of WHS to MMA and direct tightening of bolts.	Operate hoist cable as directed by C/S.			Attach and tighten top left followed by lower left WHS bolts.	Attach and tighten top right followed by lower right WHS bolts.
23	Direct torquing of WHS bolts.				Torque top left WHS bolts. Pass wrench to #4. Upon receipt of wrench from #4 torque bottom left bolt.	Torque bottom right followed by top right bolts. Pass wrench to #3.
24	Direct tension of sling strap be removed and remove sling straps from WHS.	Operate hoist cable as directed by C/S.	At left front,	At right front,	At left rear,	At right rear,
remove sling straps.						
25	Direct raising of front jacks and lowering of launch truss and insertion of front missile support lock-pin and launch truss lockpin.		Raise left front jack.	Raise right front jack and insert front missile support lockpin.	Depress launch truss.	
26			Insert launch truss lockpin.		Depress launch truss to straps.	
27	Direct fitting of forward securing strap.				Fit forward securing strap.	
28	Direct release of LWL brakes.				Release left rear brake	Release right rear brake.
29	Direct removal of LWL from under tripod hoist.	Steady sling and tripod hoist cable.	At left front,	At right front, position LWL as directed by C/S.	At left rear,	At right rear.
30	Direct removal of sling from tripod hoist and stowage of sling and straps.	Secure tools.	Remove sling and stow sling and straps.			
31	Refer to Table 3-17, March Order Tripod Hoist.					

3	Check leak and humidity indicator. Direct pressure release.		Depress buttons on pressure equalizing valve to release pressure.			
4	Designate area for container cover.		On the left front of container release T-bolts.	On the right front of container release T-bolts.	Remove access cover. Prepare cables and attach to container. Secure guide ropes attach to sling.	
5	Direct positioning of sling over container cover.	Operate boom controls on direction of C/S to position sling over container cover.	At left front of container,	At right front of container.	At left rear of container,	At right rear of container.
Attach cables to sling.						
6	Insure cables are correctly positioned and that boom hook is over the marked CG. Then signal LT operator to take up slack in sling cables. Direct removal of container cover.	Take up slack in sling cables as directed by C/S and raise container cover sufficiently to clear missile. Place container cover as directed by the C/S.	Guide container cover as directed by C/S.			
7			Disconnect cables from sling and attach lifting straps to sling.			
8	Direct positioning of sling over missile.	Position sling on direction of C/S.	At left front, remove the two bolts on each side of the cradles and place cradles at end of container.	At right front,	At left rear,	At right rear,
9	Insure sling straps are correctly positioned and that boom hook is over the marked CG. Then signal LT operator to take up slack in sling straps.	Take up slack in sling straps as directed by C/S.	At left front of MMA, or missile.	At right front of MMA, or missile.	At left rear of MMA, or missile,	At right rear of MMA, or missile.
fit sling straps around missile or MMA at correct points.						

10	Direct LT operator to raise missile or MMA from container to LT and suspend above cradles.	Raise missile or MMA on directions of C/S.	Steady MMA or missile with guide ropes.			
Caution: If MMA only is being transferred, spacer must be placed between MMA and forward MMA cradle						
11	If MMA is being transferred, direct #1 to place spacer between MMA and forward MMA cradle.		Pass rope to #2. Mount LT and if directed, place spacer between MMA and cradle.	Receive rope from #1 and steady missile or MMA.	Steady missile or MMA with guide rope.	
12	Direct cable down to lower missile or MMA into cradles. Insure the pin on the rear cradle engages the receptacle in the missile or MMA.	Lower missile or MMA into cradles on directions of C/S.	Guide missile or MMA into cradles as directed by C/S.	Steady missile or MMA during lowering.		
13	Direct fitting of securing straps.		At left front, fit WHS securing straps (if required).	At right front,	At left rear, fit MMA securing straps.	At right rear,
14	Direct cable down to remove tension from sling. Direct removal of sling.	Remove tension on sling on direction of C/S.	Release sling strap from MMA or missile.			
15	Direct LT operator to raise and traverse sling to center of stowed position.	Position boom on direction of C/S.	Remove sling from boom hook and stow sling.		Raise and secure tailgate left side.	Raise and secure tailgate right side.
16	Direct LT operator to stow boom hook and boom in traveling position.	Position boom on direction of C/S. Lower control bank levers and seat back.	Replace container cover and cradles and secure left front.	Replace container cover and cradles and secure right front.	Replace container cover and cradles and secure left rear.	Replace container cover and cradles and secure right rear.
17	Direct LT operator to reduce engine speed to idle, disengage SLO and PTO if not required for further operations. Insure that all tools and equipment are correctly stowed.	Reduce engine speed to idle, disengage PTO and SLO, switch off engine if not required for further operations.	Secure all tools.	Assist in securing tools.		

Table 3-6. Loading a MSL onto the SPL using the LT

Step	C/S	GNR	L/S	LT OP	#1	#2	#3	#4	#5
1	Direct positioning of SPL and LT. (fig. 3-5.)			Position LT, set brakes, engage SLO, and PTO, set engine speed to 1500 rpm. Mount boom seat.	Position SPL, set brakes, engage SLO, switch off engine.	Right side, lower SPL tailgate when halted.	Left side, lower LT tailgate when halted.	Right side, lower LT tailgate when halted.	Left side, lower LT tailgate when halted.
2	Direct LT OP to raise boom.	Elevate launch truss approx. 20 ft.	Remove truss locking pin.	Raise boom under direction of C/S.		Clear WHS securing straps from the WHS supports on SPL.		Obtain fin containers from LT and place on SPL.	
3	Remove transport lockpin, disengage anti-spin lugs. Insure forward launch fitting is in up position.	Release msl securing straps on LT.			Assist GNR release straps from msl.				
4	Direct GNR to connect sling to boom hook.	Obtain and fit sling to boom hook. Attach guide ropes to sling.	Obtain short Umbilical cable from LT and stow on launch truss.		Assist GNR fit sling to boom hook. Attach guide ropes to sling.				
5	Direct LT OP to traverse boom to position sling over msl CG.			Operate boom on direction of C/S.		Right front, Attach sling strap around msl at correct mark.	Left front, Attach sling strap around msl at correct mark.	Right rear, Attach sling strap around msl at correct mark.	Left rear, Attach sling strap around msl at correct mark.
6	Insure sling is correctly positioned. Direct LT OP to raise msl and traverse to launcher.			Operate boom on direction of C/S.		Steady msl with guide ropes.			
7	Direct lowering of msl onto launch fixture. Engage anti-spin lugs. Insert transport lockpin.	Guide rear of msl onto rear guide rails.		Lower msl on direction of C/S.	Guide msl onto forward launch fitting.				

Caution: Preceding step must be completed before continuing operation

8	Direct cable to release tension from sling straps.	Remove sling		Release tension on sling straps on direction of C/S.	Assist GNR removing sling.	Release forward sling strap	Release rear sling strap.
9		Depress launch truss into stops under direction of C/S.	Insert launch truss locking pin.			Fit forward WHS securing straps	Fit rear msl securing straps.
10	Return operation of LT to A&T section. Raise SPL tailgate.	Raise SPL tailgate.					

	C/S A&T	LT OP
11	Direct LT OP to traverse boom with sling to center of stowed position ----	Operate boom controls on direction of C/S A&T. Stow boom on direction of C/S.
12	Remove sling and stow. Insure all tools and equipment are stowed -----	Stow control levers and seat back. Disengage PTO, SLO, and set engine speed at idle.
13	Raise LT tailgate, right side -----	Raise LT tailgate, left side.
14	March Order LT.	

Table 3-7 Loading MSL from MMA container to LWL using tripod hoist

Step	C/S	GNR	L/S (TH OP)	#1	#2	#3	#4	#5
1	Direct positioning of TH over MMA container (3) *(2)			Position tripod hoist over MMA container.				
2	Insure that TH is directly over CG of MMA container.	Obtain all necessary tools.	Operate chain hoist.	Release cont. T-bolts.	Attach sling to hoist hook.		Release cont. T-bolts.	
3	Direct removal of MMA container cover.			Remove MMA container cover.				
4	Direct lowering of sling to approx. 3" above MMA and removal		Lower sling. (1)		Remove front upper cradle.		Remove rear upper cradle.	
					At right front of msl, attach strap.	At left front of msl, attach strap.	At right rear of msl, attach strap.	At left rear of msl, attach strap.

See footnotes at end of table.

See footnotes at end of table.

Step	C/S	GNR	L/S (TH OP)	#1	#2	#3	#4	#5
	of upper cradles (1)							
5	Insure that sling is directly over CG of msl. Direct "hoist up" to tighten straps around msl, without lifting msl from cradles.	Insure that straps are over strap marks and that no metal is touching the msl.	Apply tension of sling.	Attach guidelines to sling.				
6	Direct "hoist up" to lift msl high enough to clear container. Inspect msl for damage. Direct removal of container and positioning of LWL (2) and * (1)	Pull MMA container away from work area.	Raise hoist, steady msl with guide-rope. (1) (2)	Pull MMA container away from work area. (*1)				
7	Direct positioning of LWL under msl. Check alignment. Insure forward launch fitting is in the up position.	Remove and retain transport locking pin. Disengage locking arm assembly.	Lower hoist -----	Position LWL under direction of C/S.				Set left brake.
				Set right brake	Remove launch truss travel lockpin, lower right jack.	Release forward support lockpin, lower left jack.	Elevate launch truss approx. 20 ft.	
8	Direct positioning of msl over rear guide rails and direct hoist down.	Steady msl over rear guide rails, insert transport lockpin and engage locking arm assembly.		Steady msl with guide rope.	Steady msl with guide rope.	Steady msl with guide rope.		Steady msl with guide rope.
9	Verify that forward launch fitting is properly seated.* (1)	Install rear msl strap.	(1)	(2)			Assist GNR.	

10	Direct "hoist down" to remove tension from straps. (1) (2) *(1)		Lower hoist. (1)		Remove guide ropes, remove sling straps from msl, raise right front jack.	Raise left front jack and install forward support lockpin.	Remove guide ropes, assist #2. Depress launch truss.	
11			Raise hoist.		Install launch truss lockpin.		Depress launch truss to stop.	
12	Direct and assist in moving LWL away from TH.			Release left brake.	Move LWL away from Tripod Hoist.			Release right brake.
13			Obtain and install short umbilical cable to LWL.		Secure fin container to LWL.			Secure fin container.
14		Install msl cover.		Install msl cover.		Install msl cover.		
15		Replace cover and upper cradle of MMA container and secure all tools.						

(1) Care must be taken to prevent the hoist chain from striking the missile at all times.

(2) Do not guide missile by handling warhead section as damage to the section could result.

(3) Before placing the tripod hoist over a load or a load under the tripod hoist, one of the restraining cables will be disconnected to facilitate positioning of the tripod hoist over the load. Once positioned, the restraining cable must be reconnected.

Warning: *(1) Insure that personnel do not place any part of body under suspended load.

*(2) Insure that slope is not over 5° during emplacement and that the load is not picked up at greater than 5° slope.

Table 3-8 Fire Mission—SPL

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
1	Guide SPL over the firing stake and halt it at signal from GNR. Order "Prepare for action."	Signal C/S when SPL is over the firing stake.		Halt SPL. Set brakes. Engage SLO and switch off engine.				
2	On right of SPL, lower tailgate.	On left of SPL, lower tailgate. Assist L/S untie rear cover ropes.	On right of SPL, untie rear cover ropes. Receive cover and bows from #4 and stow,	On the left, remove front covers and bows from #4 and stow,	On the right assist #1 remove front covers and bows and stow,	On the left side remove rear covers and bows. Pass to #5 to stow,	On the right side, assist #3 remove covers and bows. Pass to L/S to stow,	On the left side, receive cover and bows from #3 and stow,

if bows and covers are installed.

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
3	Inspect the msl and drop indicator for damage.	Remove the left side fin container and pass over side to #5.	Remove the right side fin container and pass over side to #4.	Lower SPL cab.	Remove right side fin container and pass over side to #4.	Remove left side fin container and pass over side to #5.	Receive right side fin containers from #2 and L/S and place against SPL.	Receive left side fin containers from GNR and #3 and place against SPL.
4		Remove sight unit container and place it on the left sponson.	Obtain forward WHS straps from #3.		Remove rear msl strap and pass to #3. Assist #1 remove boat tail cover.	Release forward WHS straps. Stow rear msl strap. Assist GNR with sight unit container.	Remove fins from container and inspect for damage.	Remove fins from container and inspect for damage.
5		Insure locking arm assemblies are engaged.	Obtain sight unit from container and mount to intermediate bulkhead.		Secure right side crew seats in upright position.	Obtain forward mirror bracket from sight unit container. Remove shipping cover and fit forward mirror bracket.	Fit fins 2 and 3 on right side.	Fit fins 1 & 4 on left side.
6	Check autocollimation and boresight.	Autocollimate and boresight.	Open MP lid, insure all switches are "off" and range factor dials are in the "O" position. Connect short umbilical.	Release left traverse lock.	Release right traverse lock.	Hand sight unit container over side of SPL to #5.	Close right hand fin container and stow against the right track.	Receive sight unit container from #3 and place against SPL.
7			Switch MP power to "ON". Set range factors as ordered by Plt Ldr on MP. Make WHD settings as ordered by Plt Ldr. Arm SPGG.			Remove firing device from bracket on launch truss and place on lift sponson.		Close left hand fin container and stow against the left track.
						Hand firing device to #5.		Receive firing device from #3.
8	Direct #3 to remove forward mirror bracket. Verify Plt Ldr has checked WHS settings and SPG arming.		Switch to null. Perform self-test. Conduct safe-arm check. Turn function selector switch to off.			Remove forward mirror bracket from G&C when directed by C/S and hand to #5 to stow. Replace G&C screws cover. Secure		Receive forward mirror bracket from #3 and stow in sight unit container.

						left crew seats in upright position. Assist L/S in making safe arm check.		
9	Order elevate.			Elevate to required elevation on order from C/S.	Assist #1 elevate to required elevation.			

Caution: Do not remove transport lockpin until missile has been elevated to firing elevation

10	After missile is elevated, order #2 to remove transport lockpin.				On order of C/S remove transport lockpin and give to C/S.			
11	Check reautocollimation. Report to Plt Ldr "Msl ready to lay."	Reautocollimate at firing elevation. Verify traverse brake is disengaged.			Move to firing pit or other designated area.	Carry firing device to firing pit.	Move to firing pit or other designated area.	Assist #3 reeling out firing cable to firing pit.
12	Check first and last lay of msl and announce "zero mils."	Cross level sight and lay missile.		Assist GNR by traversing, elevating as required				
13	On completion of laying check elevation with GNR's quadrant. Order GNR to remove sight unit after Plt Ldr announces msl laid.	On report of "missile laid" from Plt Ldr, lock traverse brake, remove sight unit and hand to #1 to stow.	After C/S announces zero mils, sequence M/P from NULL thru launch.	Stow sight unit, secure container and stow against left track. Move to firing pit.				
14	Check for "GO" at "LAUNCH," and note time GO received, close MP lid, check arming of APU. Make final check	Move to firing pit.	Arm APU. Move to firing pit.					

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
	of launcher, move to firing pit.							
15	Insure all crew members are present.		Hand H-4137, transport lockpin, and APU extension to Plt Ldr.					
16			Arm and fire missile on order of Plt Ldr.					

Table 3-9. Change of Target Outside Traverse Limits—SPL

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
1	Insure safe-arm switch is in the safe position. Move to SPL with L/S and verify insertion of transport lockpin and safing of APU.		Move to SPL with C/S. Safe APU. Insert transport lockpin.					

Caution: Do not proceed until preceding steps are completed

2	Direct "Traverse Limited."	Move to SPL. Move SU container clear of launcher.	Zero all M/P dials and turn all switches to OFF.	Move to SPL.	Move to SPL.	Reel in firing device and place on SPL left sponson.	Move to SPL.	Assist #3 reel in firing device.
3		Engage left traverse lock. Release traverse brake and center launch truss. Assist #2 depress launcher.	Safe SPGG and warhead section when in reach.	Raise SPL cab, start engine, and disengage SLO.	Engage right traverse lock. Depress launch truss into stops.		Move containers clear of launcher. Remove fins 2 and 3 and place on container.	Move containers clear of launcher. Remove fins 1 & 4 and place on container.
4	Raise SPL tailgate.	Fit rear missile strap. Raise SPL tailgate.	Insert launch truss travel lockpin. Pass WHS straps to 3.		Replace rear missile strap.	Fit forward WHS straps.		

5	On direction of Plt Ldr, guide #1 in repositioning SPL.			Reposition SPL as directed by C/S. Set brakes, engage SLO, shut off engine.				
6	Inspect the msl.	Release rear msl strap.	Release forward WHS straps.	Lower cab.	Remove rear msl strap, pass to #3 to stow.	Release forward WHS straps.	Lower tailgate right side.	Lower tailgate left side, hand sight unit to GNR, hand forward mirror bracket to #3.
7		Mount sight unit to intermediate bulkhead.	Remove launch truss travel lockpin.	Elevate launch truss approx. 20 ϕ .		Remove G&C access cover and fit forward mirror.	Reinsert fin 2 and 3.	Reinsert fin 1 and 4.

Proceed from step 6, Fire Mission—SPL.

Table 3-10A. March Order—SPL (With MSL on Launcher)

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
				If missile round has not been fired				
1	Direct "March Order" move to SPL. Verify safing of APU and installation of transport lockpin.		Move to SPL. Safe APU if required. Insert transport lockpin.					

Caution: Do Not proceed until APU is safed and transport lockpin is installed

2	Direct crew to return to SPL.	Move to SPL.	Zero all dials on MP. Turn all switches to "OFF." Close and secure MP lid.	Move to SPL.	Move to SPL.	Reel in firing device.	Move to SPL.	Assist #3. Reel in firing cable.
3		Engage left traverse lock. Release traverse brake and traverse launch truss to center.	Detach short umbilical cable from missile and stow. Install J2 shorting plug. Safe WHS and SPGG, when in reach.	Raise cab and secure in traveling position.	Engage right traverse lock.	Stow firing device on launch fixture.	Remove fins 2 and 3, place in container and secure container lid.	Remove fins 1 & 4, place in container and secure container lid.

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
4		Assist #2 depress to stops.			Depress launch truss to stops.			
5		Stow sight unit container on launch truss and secure.	Install launch truss travel locking pin. Hand WHS straps to #3.	Pass sight unit container to GNR to stow.	Lower right side crew seats.	Assist GNR stow sight unit container. Lower left crew seats. Install forward WHS straps.		
6				Fit rear msl strap.	Fit rear msl strap.	Remove rear strap from launch truss and hand to #1.		
7							Install boattail cover.	Install boattail cover.
8		Stow left side fin container on inside of SPL.	Stow right side fin container on inside of SPL. Mount vehicle.	Mount in SPL cab. Start engine, disengage SLO.	Stow right side fin container on inside of SPL.	Stow left side fin container on inside of SPL.	Pass right fin container to L/S and #2 to stow. Mount Vehicle.	Pass left fin container to GNR and #3 to stow. Mount vehicle.
9	Raise and secure SPL tailgate right side. Direct #1 to clear area.	Raise and secure SPL tailgate left side.						

Table 3-10B March Order—SPL (After Firing)

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
1	Direct "March Order" and move to SPL.	Move to SPL.	Move to SPL and insert transport lockpin.	Move to SPL.	Move to SPL.	Reel in firing cable.	Move to SPL.	Assist #3 reel in firing cable.
2	Inspect launcher for damage that would preclude it being moved from firing position.	Engage left traverse lock. Disengage traverse brake and traverse to center.	Zero all dials on MP, turn all switches on MP to "Off." Close and secure MP lid. Detach short umbilical cable and retain.	Raise SPL cab.	Engage right traverse lock.			

3		Assist #2 depress launch truss to stops.			Depress launch truss to stops.	Secure firing device to launch truss. Lower left crew seats.		
4		Stow sight unit container on launch truss and secure.	Install launch truss locking pin.		Lower right crew seats.	Assist GNR stow sight unit container.		Pass sight unit container to GNR to stow.
5	Insure all equipment is correctly stowed.	Stow left fin container inside SPL.	Stow right fin container inside SPL.	Mount vehicle, start engine, disengage SLO.	Stow right fin container inside SPL.	Stow left fin container inside SPL.	Pass right fin container to L/S and #2 to stow.	Pass left fin container to GNR and #3 to stow.
6	Raise tailgate.	Raise tailgate.	Mount vehicle.				Mount vehicle.	Mount vehicle.
7	Direct #1 to clear area.							

Table 3-11. Fire Mission LWL

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
1	Guide LWL prime mover to position LWL over firing stake. Halt driver on signal from GNR.	Signal C/S when LWL is over the firing stake.	Dismount.	Halt vehicle on command of C/S.	Dismount.	Dismount.	Dismount.	Dismount.
2	Direct "Prepare for Action."	Apply left launcher wheel handbrake. Remove rear missile cover.	Apply right launcher wheel handbrake. Assist GNR removing missile cover.		At right front of tow bar, lower castor wheels to ground and raise tow bar from prime mover towing pintle.	At left front of tow bar, remove safety chains, electrical cable and air hose half coupling. Assist #2 if required.	At right front of missile, remove front missile cover.	At left front of missile, assist #4 removing missile cover.
3	Direct #1 to drive prime mover approx. 5 meters forward.	Remove sight unit container and place behind the msl.		Position prime mover at direction of C/S.		Assist GNR with sight unit container.		
4	Inspect drop indicator and msl for damage.	Release rear msl strap.	Release forward missile strap.		Remove rear msl strap and pass to #3 to stow.	Remove forward msl strap and stow.	Remove boattail cover and place 10 feet forward of tow bar.	Assist #4, remove boattail cover.

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
5	Inspect boattail ablative for damage.	Remove sight from container and mount to rear bulkhead, release left traverse lock.	Remove fin containers and place at right side of launcher.	Assist L/S remove fin containers.	Release right traverse lock.	Obtain forward mirror bracket from sight unit container. Remove shipping cover and fit forward mirror bracket.		
6			Remove launch truss travel lockpin and forward msl support lockpin.	Elevate launch truss to approx. 20°.				
7	Direct extension of stabilizing jacks until both wheels are clear of the ground.	Autocollimate and bore-sight.		Lower left rear stabilizing jack and secure jack down lockpin. Extend jack until the pad is seated on the ground.	Lower right rear stabilizing jack and secure jack down lockpin. Extend jack until the pad is seated on the ground.	Remove firing device from launch truss.	Lower right front stabilizing jack and secure jack down lockpin. Extend jack until the pad is seated on the ground.	Lower left front stabilizing jack and secure jack down lockpin. Extend jack until the pad is seated on the ground.
8			Open M.P. Insure all switches are in the "off" position and range factor dials are in "O" position. Connect short umbilical cable to missile. Switch MP to "on." Set range factor dials as ordered, make warhead settings as ordered. Arm SPGG.	Extend jack on direction of C/S until wheel is clear of the ground. Assist #5 as directed by C/S.	Extend jack on direction of C/S until wheel is clear of the ground. Assist #4 as directed by C/S.		Extend jack on direction of C/S until wheel is clear of the ground. Open fin container, inspect fins and fit fins 2 and 3 close and stow container.	Extend jack on direction of C/S until wheel is clear of the ground. Open fin container, inspect fins and place on container.
9	Check autocollimation and boresight. Verify platoon leader has checked WHS & SPGG arming.	Verify traverse brake is disengaged.	Cycle MP thru "selftest" and perform safe/arm check, switch to "null."			Asst L/S perform "safe/arm" check.		

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
10	Order elevate _____ mils.	Maintain sight bracket level as msl is being elevated. Reautocolimate at firing elevation.		Elevate missile to required elevation.	Assist #1 elevate msl to required elevation.	Remove forward mirror bracket and stow in sight unit container. Move to fitting pit with firing device.		Assist #3 reel out firing device.

Caution: Do not remove transport lockpin until missile has been elevated to firing elevation

11	After missile is elevated, order #2 to remove transport lockpin.				On order of C/S, remove transport lockpin and give to C/S.			
12	Check reautocolimation. Report "Ready to be laid."	Cross level the sight and lay the missile.		Assist GNR by traversing or elevating as necessary.	Move to firing pit.			
13	On completion of laying check elevation with gunners quadrant on report "msl laid," order gunner to remove sight unit.	On order of C/S, remove sight unit and hand to #1 stow. Place sight unit container 10 feet forward of tow bar.	On report of "zero mils," cycle MP "null" thru "cal." On report of "msl laid," cycle MP thru "launch."	Stow sight unit in container, close and secure the container. Place container. Assist GNR stow sight unit container.			Fit fins 1 and 4, secure fin container and stow. Move to firing pit.	
14	Check for "go" in "launch" close and secure MP lid. Make final check of launcher move to firing pit insure crew is present.	Move to firing pit.	Arm the APU. Move to firing pit, hand transport lockpin and APU upper rod to Plt Ldr.	Move to firing pit.				
			"Arm" and "Fire" missile on orders of Plt Ldr.					

Table 3-12 Change of Target Outside Traverse Limits—LWL

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
1	Insure safe arm switch is in the safe position.							
2	Move to LWL with L/S. Verify safing of APU and insertion of transport lock-pin.		Move to LWL. Safe APU and insert transport lock-pin.					

Caution: Do not proceed to step #3 until step #2 is complete

3	Direct "Traverse Limited."	Move to LWL	Zero all dials and turn all MP switches to off.	Move to LWL.	Move to LWL.	Reel in firing cable.	Move to LWL.	Assist #3 reel in firing cable.
4		Engage left traverse lock, release traverse brake, center truss. Assist #1 depress launch truss.		Engage right traverse lock, depress launch truss to approx. 20 ϕ .	Assist #4 removing and storing fins.	Install firing device on launch truss.	Move fin container clear of the launcher. Remove fins 2 and 3 and place fins on container.	Move fin container clear of the launcher. Remove fins 1 and 4 and place fins on container.
5			Safe SPGG and WHS when in reach.	Assist #5 removing and stowing fins.		Extend castor wheels until they contact the ground.		
6		Fit rear missile strap.		Assist GNR, fit rear msl strap.				

Caution: Rear stabilizing jacks must be clear of ground before retracting front jacks

7	Direct retracting of stabilizing jack until both wheels are off the ground. Check to insure castor wheels are extended and are in contact with the ground.	Depress launch truss to stops.	Assist #4 raising and securing jacks. Install forward support lockpin.	Retract left rear jack, until pad clears the ground as directed by C/S.	Retract right rear jack until pad clears the ground as directed by C/S.	Assist #5 raising and securing jack.	Raise left front jack and secure.	Raise right front jack and secure.
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8	Direct crew in repositioning LWL.	Release left hand brake.	Release right hand brake.	At left rear of launch fixture.	At right rear of launch fixture.	At tow bar,	At right front of launch fixture,	At left front of launch fixture.
assist in repositioning at direction of C/S.								

Proceed with step 2 from procedures for fire mission LWL (Table 3-11)

Table 3-13A March Order LWL (With Missile Round on Launcher)

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
1	Insure Safe-Arm switch is in the safe position.							
2	Move to LWL with L/S and verify safing of APU and insertion of transport lock-pin.		Move to LWL with C/S—safe APU insert transport lock-pin.					

Caution: Do not proceed to step #3 until step #2 is completed

3	Direct #1 to return prime mover to LWL and remainder of crew to return to LWL.	Move to LWL.	Turn all MP switches to "off." Zero all dials. Close and secure MP cover.	Drive prime mover to LWL at direction of C/S back to within 5 meters of tow bar.	Move to LWL.	Reel in firing cable.	Move to LWL.	Assist #3 reel in firing cable.
4		Engage left traverse lock. Release traversing brake and traverse launch truss to center. Assist #2 in depressing launch truss.	Detach short umbilical cable from missile and stow. Install J-2 shorting plug. Safe WHS and SPGG when within reach.		Engage right traverse lock. Depress launch truss to approx. 20 °.	Stow firing device on launch fixture.	Remove fins #2 and #3, place in container, secure container lid. Assist #5 placing fin containers on launch truss.	Remove fins #1 and #4, place in container, secure container lid. Place and secure fin containers on launch truss.
5							Fit boattail cover.	Fit boattail cover.

Caution: Do not proceed to step #6 until step #5 is complete

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
6		Stow sight unit container on launch truss and secure.				Assist GNR in stowing sight unit container.		
7	Direct retracting of stabilizing jacks. Check to insure castor wheels are extended and are on the ground.	Caution: Rear stabilizing jacks must be clear of the ground prior to raising front jacks						
				Retract left rear jack and secure.	Retract right rear jack and secure.		Retract right front jack and secure.	Retract left front jack and secure.
8		Depress launch truss into stops.	Insert forward missile support lockpin. Insert launch truss travel lockpin.				Fit forward missile strap.	Fit forward missile strap.
9	Direct #1 to back prime mover to LWL and attach LWL to vehicle.	Install rear msl cover.	Assist GNR install rear msl cover.	Move prime mover at direction of C/S.	Fit safety chains and connect air hose and electrical cable.	Raise or lower castor wheels to engage LWL lunette with towing pintle. Retract castor wheels and stow.	Install front msl cover.	Install front msl cover.
10	Direct crew to mount. Mount section vehicle.	Release LWL right hand brake. Mount section vehicle.	Release LWL left hand brake. Mount prime mover.	Mount prime mover.				

Table 3-13B March Order LWL (After Missile is Fired)

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
1	Direct "March Order" Move to LWL and inspect launcher for damage that	Move to LWL. Engage left traverse lock, release traverse brake traverse launch truss	Move to LWL.	Move prime mover to LWL back to within 5 meters of tow bar.	Move to LWL. Engage right traverse lock. Depress launch truss into stops.	Reel in firing cable. Stow firing device on launch fixture. Extend castor wheels until they	Move to LWL. Place fin containers on launch truss.	Assist #3 in reeling in firing cable. Assist #4. Place fin containers on launch truss.

	could prevent the launcher from being moved.	to center. Assist #2 in depressing launch truss.				contact the ground.		
2	Direct retracting of stabilizing jacks. <i>Note.</i> Insure castor wheels are extended until they contact the ground.			Raise and secure left rear stabilizing jack.	Raise and secure right rear stabilizing jack.		Raise and secure right front stabilizing jack.	Raise and secure left front stabilizing jack.
3		Stow sight unit container.	Insert forward missile support lockpin.			Assist GNR stowing sight unit container.		
4	Direct #1 to back prime mover to LWL and attach the LWL to vehicle.		Insert launch truss travel lockpin.	Move prime mover at direction of C/S.	Fit safety chains, connect air hose coupling and electrical cable.	Raise or lower castor wheels to engage the towing eye to prime mover towing pintle raise castor.		
5	Direct crew to mount. Check launcher and area. Mount section vehicle.	Release LWL left wheel brake. Mount section vehicle.	Release LWL right wheel brake. Mount section vehicle.	Mount prime mover.	Assist #4 passing boatcover to #5 and mount prime mover.	Mount prime mover.	Pass boattail cover to #5 and mount prime mover.	Mount prime mover and receive boat-tail cover.

Table 3-14A Conversion: LWL to SPL

Step	C/S	LT OP	#1	#2	#3	#4	#5
1	Direct positioning of vehicles and equipment. (fig 3-12).	Position LT as directed by C/S, apply vehicle brakes, engage SLO and PTO, and set engine speed at 1500 rpm.	Position SPL as directed by C/S.	Lower SPL tailgate.		Lower LT tailgate.	
2				Remove launch truss locking pin and forward support locking pin.	Remove forward msl tiedown strap and place with mobility kit rear frame assembly.	Elevate launch truss approximately 20°.	
3				Remove forward jack assist springs, stow on rear frame assembly.			

Step	C/S	LT OP	#1	#2	#3	#4	#5
4				Lower jacks and secure in down position. Operate jacks to raise wheels off ground.			
5	Direct positioning of boom hook over rear frame assembly.	Position boom hook as directed by C/S.				Attach boom hook to rear frame assembly.	
6					Loosen four bolts attaching towing bar to base frame of launch fixture.	Disconnect electrical cable on towing bar from connector on base frame. Remove dust cap from dummy coupling and place over cable connector. Connect cable to dummy coupling.	Disconnect air brake hose and stow on half coupling.
7	Direct raising of rear frame assembly sufficiently to enable attachment of towing bar and wheels.	Raise rear frame under direction of C/S.		Remove towing bar from base frame and fit to mobility kit rear frame assembly.			
8				Disconnect brake couplings from trailing arms and connect plugs to couplings.		Attach front beam assembly to rear frame assembly.	
9				Remove shock absorber link bolts from trailing arms.			
10				Remove right wheel and shock absorber, place on right of launcher.	Remove left wheel and shock absorber, place on left of launcher.	Assist #2.	Assist #3.
11						Place blocks beneath launch fixture.	
12				Lower launch fixture onto blocks.			
13						Fit right and left wheels and shock absorbers to mobility kit.	
14				Remove four jacks from launch fixture.			
15				Install protective plugs into rear jack pivot holes, install securing bolts into aircraft winch shaft assembly. Place remaining bolts in tool box on towing bar.		Replace all jack pins in rear tool box on mobility kit rear frame assembly.	
16					Depress launch truss to stops, fit launch truss travel lockpin.		
17				Attach two 44 inch cables to forward lifting shackles of launch truss and attach two 44 inch cables and two 16 inch cables to rear lifting shackles of launch truss.			

18				Attach beam to cable.	Remove boom hook from mobility kit.
19	Direct positioning of boom hook over CG of launch fixture.	Position boom hook under direction of C/S.		Attach boom hook to beam and attach guide ropes to each end of base frame.	Install a guide pin in each of the rear outer securing bolt holes in SPL.
20	Direct raising of launch fixture high enough to clear SPL sponsons.	Raise launch fixture under direction of C/S.	Back SPL until launch fixture can be lowered over guidepins. Set SLO and switch off engine.	Insure that SPL tailgate does not drag when vehicle is moving.	Steady launch fixture.
21	Direct lowering of launch fixture into SPL.	Lower launch fixture into SPL under direction of C/S.			Steady launch fixture.
22					Remove guide pins and insert eight securing bolts. Torque bolts to 100 ± 8 foot pounds.
23				Remove beam and cables from launch truss, remove beam from boom hook and stow.	
24		Return boom to traveling position, idle engine, disengage PTO SLO.		Raise SPL tailgate and secure.	Raise LT tailgate and secure.
25				Place all straps, stores, etc. back on the mobility kit.	

Table 3-14B Conversion: SPL to LWL

Step	C/S	LT OP	#1	#2	#3	#4	#5
1	Direct positioning of vehicles and equipment (fig. 3-13).	Apply vehicle brake, engage SLO, PTO and set engine speed at 1500 rpm.	Apply vehicle brakes and switch off engine.	Lower SPL tailgate.		Lower LT tailgate.	
2				Remove eight bolts securing launch fixture to vehicle.		Remove four jacks, jack struts and two jack assist springs from mobility kit and place left of SPL.	
3						Remove front beam assembly.	

Step	C/S	LT OP	#1	#2	#3	#4	#5
4				Obtain beam sling and remove sling straps. Attach two 44 inch cables to forward lifting shackles of launch truss, attach two 16 inch and two 44 inch cables to rear lifting shackles of launch truss, and attach cables to beam.			
5	Direct positioning of boom hook over CG of launch fixture.	Position boom hook under direction of C/S. Attach beam to hook.	Attach a rope to each end of launch fixture.				
6	Direct raising of launch fixture high enough to clear sponsons.	Raise launch fixture under direction of C/S.		Steady launch fixture.		Insure that tailgate does not drag when vehicle moves.	
7			Drive vehicle forward sufficiently to clear launch fixture.			Place blocks beneath launch fixture.	
8	Direct lowering of launch fixture onto blocks.	Lower launch fixture under direction of C/S.	Remove beam and cables from launch fixture.				
9	Direct positioning of boom hook over mobility kit rear frame assembly.	Position boom hook under direction of C/S.		Remove launch truss travel locking pin.	Elevate launch truss approximately 20°.	Insert boom hook into lifting eye on rear frame assembly.	
10	Direct LT OP to take up slack in hoist cable so that the weight of the mobility kit is on hook.	Take up slack in cable as directed by C/S.		Attach rear stabilizing jacks.		Remove wheels and shock absorbers from mobility kit and position on either side of launch fixture.	
11				Attach forward jack assist springs followed by forward jacks.			
12				Extend jacks to raise launch fixture to its full extent.			
13				Attach bump stops.			
14				Attach right shock absorber and wheel.		Attach left shock absorber and wheel.	
15				Attach shock absorbers to trailing arms.			
16				Disconnect plugs from brake couplings and connect couplings to trailing arms.			
17				Remove trailing bar from mobility kit.			

18						Connect air brake hose.	Remove dust cap from electrical connector on base frame, detach electrical cable from dummy coupling on towing bar, fit dust cap to dummy coupling and connect electrical cable to connector.
19						Attach tow bar to base frame and tighten nuts.	
20				Raise and secure jacks in traveling position.			
21				Attach forward support lockpin.		Depress launch truss to stops.	
22				Insert launch truss travel lockpin.	Obtain forward msl tiedown strap from mobility kit and secure it to launch truss.		
23				Raise SPL tailgate and secure.		Raise LT tailgate and secure.	
24				Remove rear frame assembly from boom hook and place it in the towing vehicle.			
25		Return boom to traveling position, idle engine, disengage PTO, SLO, and switch off engine		Place equipment in towing vehicle.			

Table 3-15 Erecting the Tripod Hoist

Step	C/S	#1	#2	#3	#4	#5
1	Direct the positioning of the tripod and chain hoist.	Obtain tripod and lay on ground so that one leg is flat on the ground and the other two are on top, and the eye connection for the chain hoist is facing outward.				Obtain chain hoist.
	Direct positioning of tripod.	Disconnect restraining cables.	Raise one leg and rotate through 180° until it is laying on the ground to form a “Y” with the other top leg.		Raise one top leg and rotate it through 180° until it is laying on the ground to form a “Y” with the other top leg.	
2	Direct raising of tripod, and attaching of chain hoist.	Attach the chain hoist hook to the eye on the tripod, and remove chain from storage box.	Raise tripod hoist until Apex is about 3 ft. off the ground.	Move one leg and steady the tripod.		

Step	C/S	#1	#2	#3	#4	#5
3	Direct raising of tripod hoist to operating position.	Attach restraining cables between legs when in vertical position.	Assist crewmen 3, 4 and 5 alternately in walking legs to center.	Walk one leg inward toward center until restraining cable can be connected between tripod legs.		
				Walk out legs until restraining cables are tight.		

Notes: 1. This procedure is written for six men from either the Firing or the A&T Sections. Crew personnel will be numbered 1 to 5 as detailed by C/S.

2. Before placing the tripod hoist over a load or a load under the tripod hoist, one restraining cable will be disconnected to facilitate positioning of the tripod hoist over the load. Once position, the restraining cable must be reconnected.

Table 3-16 March Order Tripod Hoist

Step	C/S	#1	#2	#3	#4	#5
1	Direct lowering of tripod.	Disconnect one restraining cable.		Steady tripod legs by insuring pad on tripod does not slip.		
2	Direct lowering of one leg, and disconnection of chain hoist.	When tripod hoist is lowered, disconnect chain hoist.	Walk one leg outward away from Apex of tripod until Apex is approximately 36 inches from the ground.		Continue steadying one tripod leg.	
3	Direct lowering of tripod to ground.	After tripod is lowered to ground, disconnect remaining restraining cable.	Lower tripod to ground.		Raise one leg and rotate it through 180° until it is laying on one other leg.	
4	Direct securing of tripod, chain hoist and sling.	Stow chain hoist and sling.	Secure the leg securing strap.	Secure restraining cable.		

Notes: 1. This procedure is written for six men from either the Firing or the A&T Sections. Crew personnel will be numbered 1 to 5 as detailed by C/S.

2. Before placing the tripod over a load or a load under the tripod hoist, one restraining cable will be disconnected to facilitate positioning of the tripod hoist or the load. Once positioned, the restraining cable must be reconnected.

Table 3-17 Transferring a MSL From the LWL to the LT

Step	C/S	LT operator	#1	#2	#3	#4
1	Direct positioning of LT on either side of LWL. Insure both LWL handbrakes are set.	Position LT as directed by C/S. Set brakes, engage SLO, PTO and set engine speed at 1500 rpm. Mount boom seat.	Lower LT tailgate.		Obtain beam and attach guideropes.	

Caution: LWL handbrake must be set before proceeding.

Launch truss must be elevated approximately 20 mils above horizontal

2	Direct positioning of beam over msl. Direct placing of sling straps on correct missile strap marks.	Position boom as directed by C/S.	Remove forward missile securing strap. Position forward sling strap.	Attach beam to boom tackle hook. Position rear sling strap.
3	Direct LT operator to take up tension on straps.	Operate boom to take up tension on straps.		
4	Direct removal of tie-down straps.			Remove rear missile tie-down strap. Assist #3.
5	Direct lowering of front jacks.		Lower front jacks.	
6	Remove transport lock-pin and anti-spin lugs. Direct raising of missile to clear LWL. Direct transfer and lowering of missile onto cradles of LT.	Raise missile on direction of C/S. Operate boom to transfer and lower missile onto cradle of LT at direction of C/S.	Steady missile on LWL using guideropes.	
7	Direct securing of missile.		Fit WHS securing straps.	Fit MMA securing straps.
8	Direct LT OP to relieve tension from straps.	Lower boom to relieve strap tension.	Remove forward sling strap.	Remove rear sling strip.
9	Direct LT OP to traverse boom insuring beam is clear of missile.	Traverse boom on direction of C/S.	Insure beam is clear of msl.	Pick up fin containers and store on LT.
10	Direct LT OP to swing boom to center of stowed position and stow boom.	Operate boom on direction of C/S. Secure boom seat, disengage PTO, SLO, and upon direction of C/S, march order LT.	Raise LT tailgate.	Remove beam and stow on LT.

Table 3-18 Rate of Fire

Part A

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
1	Direct Fire Mission, Rate of Fire, and move to SPL. Inspect launcher for damage.	Move to SPL. Engage left traverse lock. Disengage traverse brake and traverse to center.	Move to SPL. Zero all dials on Mp, turn all switches on MP to "OFF". Close and secure MP lid. Detach short umbilical cable.	Move to SPL. Move sight unit container out of way of LT if necessary.	Move to SPL. Engage right traverse lock.	Reel in firing cable.	Move to SPL.	Assist #3 reel in firing cable.
2	Call LT into position.	Assist #2 depress launch truss to approx. 20°.	Lock front launch fitting in the up position.		Depress launch truss to approx. 20°.			

Part B

Step	C/S	LT OP	GNR	L/S	#1	#2	#3	#4	#5
1	Direct positioning of LT.	Position LT as directed by C/S. Set brakes, engage SLO, PTO. Set engine speed at 1500 rpm. Mount boom seat.						Right side, Lower LT tailgate.	Left side, Lower LT tailgate.
2	Direct raising of boom.	Raise boom on direction of C/S.	Release msl securing straps on LT.			Clear WHS securing straps from the WHS supports on SPL.		Obtain fin containers from LT & place behind and to side of SPL.	
3	Remove transport lockpin, disengage antispin lugs, insure forward launch fitting is in up position.								

4	Direct GNR to connect sling to boom hook.		Obtain and fit sling to boom hook. Attach guide ropes to sling.	Obtain short umbilical cable from LT and stow.	Assist GNR fit sling to boom hook and attach guide ropes to sling.				
5	Direct traversing of boom to position sling over msl CG.	Traverse boom as directed by C/S.				Right front,	Left front,	Right rear,	Left rear,
						attach sling strap around msl at correct mark.			
6	Insure sling is correctly positioned. Direct LT OP to raise msl and traverse to launcher.	Operate boom as directed by C/S.				Steady msl with guide ropes.			
7	Direct lowering of msl onto launch fixture. Engage anti-spin lugs, insert transport lockpin.	Lower msl on direction of C/S.	Guide rear of msl onto rear guide rails.		Guide msl onto forward launch fitting.	Steady msl with guide ropes.			

Caution: Preceding step must be completed before continuing operation

8	Direct cable down to release tension from sling straps.	Release tension on sling straps on direction of C/S.				Release forward sling strap.		Release rear sling strap.	
9	Direct "Prepare for action."								
10	Return control of LT to C/S A&T Section. Go to step 1, part C.								
	C/S A&T		LT OP		#1 A&T			#2 A&T	
11	Direct LT OP to traverse boom to center of stowed position. Supervise crew march ordering Lt. Insure all tools and equipment are properly stowed.	Operate and stow boom on direction of C/S A&T.			Remove sling and stow sling beam.				

	C/S A&T	LT OP	#1 A&T	#2 A&T
12		Stow control levers and seat back. Disengage TO, SLO and idle engine.	Right side, raise LT tailgate, Mount LT.	Left side,
13	Direct and guide LT movement to hide area.	Move LT on direction of C/S.		

Part C

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
1	Inspect the msl and drop indicator for damage.							
2				Remove boattail structural cover.	Assist #1 remove boattail cover.		Remove fins from container and inspect for damage.	Remove fins from container and inspect for damage.
3	Insure antispin lugs are engaged.	Obtain sight unit from container and mount to interbulkhead.			Secure right side crew seats in upright position.	Obtain forward mirror bracket from sight unit container. Remove shipping cover and fit forward mirror bracket.	Fit fins 2 and 3 on right side.	Fit fins 1 and 4 on left side.
4		Autocollimate and boresight.	Open MP lid, insure all switches are "OFF" and range factor dials are in the "0" position. Connect short umbilical.	Release left traverse lock.	Release right traverse lock.			
5	Check autocollimation and bore-sight.		Switch MP power to "ON." Set range factors as ordered by Plt Ldr on MP. Make WHD settings as ordered by Plt Ldr. Arm SPGG.			Remove firing device from bracket on launch truss and place on left sponson.	Close right hand fin container and stow against the right track.	Close left hand fin container and stow against the left track.

6						Hand firing device to #5.		Receiving firing device from #3.
7	Direct #3 to remove forward mirror bracket. Verify Plt Ldr has checked WHS settings and SPGG arming.		Switch to null. Perform selftest. Conduct safe-arm check.			Remove forward mirror bracket from G&C when directed by C/S and hand to #5 to stow. Replace G&C screws cover. Secure left crew seats in upright position. Assist L/S in making safe-arm check.		Receive forward mirror bracket from #3 and stow in sight unit container.
8	Order elevate mls.			Elevate to required elevation on order from C/S.	Assist #1 elevate to required elevation.			

Caution: Do not remove transport lockpin until missile has been elevated to firing elevation

9	After missile is elevated, order #2 to remove transport lockpin.				On order of C/S, remove transport lockpin and give to C/S.			
10	Check reautocolimitation. Report to Plt Ldr "Msl ready to lay."	Reautocollimate at firing elevation. Verify traverse brake is disengaged.	Switch MP back to NULL.		Move to firing pit or other designated area.	Carry firing device to firing pit.	Move to firing pit or other designated area.	Assist #3 reeling out firing cable to firing pit.
11	Check first and last lay of msl.	Cross level sight and lay missile.		Assist GNR by traversing, elevating as required.				
12	On completion of laying, check elevation with GNR's quadrant. Order GNR to remove sight unit.	On report of "missile laid" from Plt Ldr, lock traverse brake, remove sight unit and hand to #1 to stow.	After Plt Ldr announces zero mls, sequence M/P from NULL thru launch.	Stow sight unit, secure container and stow against left track. Move to firing pit.				

Step	C/S	GNR	L/S	#1	#2	#3	#4	#5
13	Check for "GO" at "LAUNCH", close MP lid, check arming APU, by pressing on the APU with thumb. Make final check of launcher, move to firing pit.	Move to firing pit.	Arm APU. Move to firing pit.					
14	Insure crew, APU and transport lock-pin are present in the firing pit.		Hand H-4137, transport lock-pin, and APU extension to Plt Ldr.					
15			Arm and fire missile on order of Plt Ldr.					

CHAPTER 4

SITUATIONS REQUIRING SPECIAL ATTENTION

(STANAG 2314)

4-1. Precision in Laying the Missile

It is not feasible to fire round-by-round cannon artillery type adjustment with the Lance missile. Therefore, precise and accurate procedures assume added significance. Sighting and laying instruments and traversing mechanisms must be properly operated to compensate for mechanical backlash. To insure accurate missile lay, the officer or noncommissioned officer in charge of the section must verify missile lay prior to firing.

4-2. Holds

a. The term "hold" is defined as the suspension of the firing procedures and may be called at any time prior to firing the missile.

b. A hold may be requested by any individual associated with the firing activities.

c. When the command "Hold" is given, the individual commanding the hold will announce the reason and, if possible, the length of time required before operations can be resumed.

d. The firing platoon leader will investigate the condition that caused the command to be given. He will determine the length of the hold and report the conditions to the battery commander and battalion operations.

e. The maximum hold time permitted in the Launch mode of MP operations without recycling is 15 minutes. An indefinite hold is possible with the MP power on and the selector switch in the off position. No hold is permitted in any other MP mode of operation.

4-3. Cancel Mission

a. The term "cancel mission" is defined as the termination of a fire mission in progress and may be called at any time prior to firing the missile.

b. The command "cancel mission" normally is given to the firing platoon by the fire direction center (FDC). At the command "cancel mission," all preparations for firing will terminate immediately. Disarm procedures (para 4-4b) and applicable march order procedures (tables 3-10, 3-13), if appropriate, will be performed.

4-4. Disarm Procedures

a. Disarm procedures will be performed after a cancelled mission, or failure to fire, and prior to moving a launcher which is carrying a missile that has undergone any portion of the firing procedures.

b. Disarm procedures are:

(1) Place SAFE-ARM switch on firing device to SAFE position.

(2) Reinsert antipropulsion device; install transport locking pin.

(3) Return all MP switches to "Off" or "0" (zero).

(4) Disconnect missile umbilical cable.

(5) Lower missile until SAFE-ARM mechanism (igniter) can be reached; place SAFE-ARM mechanism in SAFE position.

(6) Install shorting plug on missile J2 connection (where umbilical cable is connected to the missile).

(7) Safe missile warhead section.

4-5. Failure to Fire Procedures

When the firing device FIRE switch is activated and the missile fails to fire, this indicates that electrical power may have been applied to the SPGG igniter squibs and the squibs may or may not have fired. When this occurs, the following procedures will be followed:

a. Immediately make three additional attempts to fire the missile.

b. If the third attempt to fire is unsuccessful, place firing device SAFE-ARM switch in SAFE position.

Warning. Wait a minimum of 60 minutes before approaching the missile.

c. After observing the mandatory time interval, not more than two men perform disarm procedures (para 4-4b).

d. Remove missile from the launcher, store it in an isolated area, and request assistance from the DS unit.

e. Reject the WHS.

4-6. Operations Under Unusual Conditions

For instructions on the operation of the Lance missile system under extreme cold, heat, dusty environment, and fording conditions, see TM 9-1425-485-10-2.

4-7. Helicopter Delivery

For instructions on preparation for helicopter delivery of the Lance missile system, see TM 9-1425-485-10-2.

CHAPTER 5

MAINTENANCE AND INSPECTION

5-1. General

a. Maintenance and inspection are essential to insure that the unit is prepared to perform its mission immediately. Systematic maintenance and inspection provide the best insurance against unexpected breakdown at the critical moment when maximum performance is essential.

b. Calibration and load testing of Lance system equipment will be provided by the direct support (DS) unit.

5-2. Disassembly, Adjustment, and Assembly

Procedures for disassembly, adjustment, and assembly of firing platoon and assembly and transport platoon equipment authorized to be performed by battery personnel are prescribed in appropriate technical manuals, as listed in appendix A, and supplemented by instructions contained in Department of the Army supply manuals. Deviation from these procedures is prohibited unless authorized by the responsible commander.

5-3. Records

The principal records pertaining to maintenance of Lance-peculiar equipment are the missile equipment log and the log books for the ground support equipment. Complete instructions regarding the procedure for making entries in these records are contained in TM 38-750. The entries must be kept current, and the missile equipment log must accompany the missile at all times until the missile has been fired. The missile equipment log will then be disposed of in accordance with TM 38-750.

5-4. Maintenance

Detailed instructions concerning the maintenance of missile ground support equipment are published in the appropriate technical manuals, as listed in appendix A, and lubrication orders are provided for each major item of equipment.

5-5. Inspections

Regular inspections are required to insure that equipment is maintained in a combat serviceable condition.

a. Each section chief is responsible for the equipment within his section. He should make a general inspection each day, and a detailed inspection of different equipment each day, insuring that each item is inspected approximately twice a week. When any need for adjustment or repair is discovered, it should be reported immediately to the platoon leader so that corrective action can be taken.

b. Each platoon leader, accompanied by the appropriate section chief, should make a daily inspection of equipment, and should make a thorough mechanical inspection of each major equipment item as often as necessary. This inspection should include auxiliary equipment, tools, and replacement items.

c. Battery, battalion, and higher commanders should make frequent command inspections to insure that equipment in their commands is being maintained at prescribed standards.

d. Detailed instructions for inspecting the ground support equipment are contained in the appropriate technical manuals listed in appendix A.

e. Duties of individuals in performing the necessary inspections and maintenance of equipment in each section are assigned by the section chief. When the section is reduced in strength, the section chief will reassign duties to insure that all maintenance is performed.

5-6. Inspection Before Operation (March)

The inspection before operation is a final check of equipment performed before the unit leaves the motor park for training in the field or the bivouac area, before combat, or before displacement. After the equipment has been inspected

and all necessary maintenance completed, the equipment should be ready for operation.

5-7. Inspection During Operation (March)

The inspection during operation consists of constant checks on the functioning of the equipment and the security of all transported equipment.

5-8. Inspection During the Halt

The inspection during the halt is made at the

discretion of the unit commander. The halt affords personnel the opportunity to inspect for malfunctions that cannot be detected during operation.

5-9. Inspection and Maintenance After Operation

Immediately after operation, all equipment is serviced, prepared for further sustained operation, and inspected to determine the need for maintenance.

CHAPTER 6

DECONTAMINATION OF EQUIPMENT

(STANAG 2103)

6-1. General

a. Operations in a nuclear, biological, or chemical (NBC) environment may result in hazards from either enemy or friendly employment of NBC weapons. When the possibility of such hazards arises, personnel must use available protective equipment and employ prescribed defensive measures in order to minimize casualties and insure mission accomplishment. Some defensive measures available to the Lance firing battery are:

(1) The use of chemical detection systems, including employment of automatic alarms.

(2) The use of protective shelters, paulins, and other available cover to protect personnel and materiel against agent contamination.

(3) The use of protective masks, gloves, and clothing to protect personnel against agent contamination.

(4) First aid for personnel affected by NBC contaminants.

(5) Decontamination of personnel and equipment.

b. Unit defense against nuclear weapon effects should include protection against the initial effects (blast, heat, and radiation) and residual radiation. FM 21-40 contains guidance on unit defenses against nuclear attack.

c. Unit defense against chemical and biological weapons effects should include assuming a mission-oriented protective posture as outlined in FM 21-40.

d. Equipment which has been contaminated by chemical, biological, or radiological (CBR) agents must be decontaminated in order to reduce the chance of injury to personnel. Decontamination can be accomplished by covering, removing, or destroying the contaminant or neutralizing it into a harmless substance. Personnel involved with decontamination should become

familiar with the procedures outlined in TM 3-220 and FM 21-40. These personnel should wear protective masks and normal clothing buttoned at the neck and tied at the wrists and ankles (trousers bloused). For added protection, any other available protective items should be worn.

Warning. Decontamination should not be performed in an area that will be used for future operations.

6-2. Chemical Decontamination

Metal parts exposed to blister and V-agents can be decontaminated with DS-2 solution, which is available to the Lance firing battery. Electrical devices which contain electron tubes or other heat-producing units are normally decontaminated by the heat given off during operation.

6-3. Biological Decontamination

A decontaminant for destroying or removing biological contamination should be effective against a variety of biological agents. In addition to natural decontaminants such as sunlight, wind, rain, etc., several chemical decontaminants are currently available. Most decontaminants and procedures for chemical decontamination are also effective for biological decontamination. Natural decontamination by rain, wind, or sunlight will destroy most biological agents on the exterior of equipment within a day. Ethylene oxide may be used to decontaminate the interior of equipment.

6-4. Radiological Decontamination

Decontaminants with good cleansing characteristics normally are used for radiological decontamination, since the contaminants from fallout are usually very small, dust-like particles which adhere closely to materials and tend to settle

into pores and crevices. In most military situations, radiological contaminants are satisfactorily removed by flushing the contaminated area with water, by the use of steam, or by brushing.

The employment of DS-2 solution and use of procedures for chemical decontamination of equipment will also remove most radiological contamination.

CHAPTER 7

SAFETY PRECAUTIONS

7-1. General

Safety precautions to be observed in training are prescribed in AR 385-62. The purpose of this chapter is to outline the important safety precautions to be observed by personnel in the Lance firing battery. The commanding officer is solely responsible for the safety of his unit. All officers must understand and accept the responsibility for insuring that troops are thoroughly familiar with their duties and for the enforcement of safety rules and regulations. Emphasis is placed on precautionary measures required to avoid bodily injury caused by the missile propellants. Refer to TM 9-1425-485-10-2 for specific safety procedures utilized during operation and maintenance of the Lance missile system.

Warning. If a propellant leak is detected at any time, immediately warn all personnel and evacuate the area to a minimum distance of 457 meters (500 yards) upwind and notify the explosive ordnance disposal (EOD) team.

7-2. Principles

The cardinal safety principle to be observed in operations involving explosives, toxic agents, and fire hazards is to limit the exposure time of a minimum number of personnel to a minimum amount of hazardous material consistent with safe and efficient operation. This principle implies that—

- a. Hazardous working areas will be separated from all other areas.
- b. The minimum number of personnel needed for efficient operation will be employed in hazardous working areas.
- c. Only the minimum necessary amount of hazardous material will be present in the working area.

7-3. Smoking

Do not smoke within 50 meters of the missile

at any time and do not smoke or carry flame-producing devices into the storage areas.

7-4. Hydraulic Safety

Hydraulic pressure is used for lifting and swinging heavy weights in Lance peculiar equipment. The following precautions should be observed by personnel in the area where hydraulic power is being used:

- a. Do not place hands or other parts of the body under a suspended load.
- b. Personnel should stand clear of hydraulic lines. A ruptured hydraulic line will spew fluid which can blind or burn.
- c. The boom operator on the loader-transporter must always keep his feet in the pedestal foot rests when operating the boom to prevent bodily injury.
- d. The boom operator will operate the boom only as directed by the chief of section or other designated personnel.

7-5. Training Safety

If for any reason any to-be-fired warhead section (practice or tactical) is mated to a tactical or training missile, any training sequence must be terminated prior to activation of the fire switch. This is necessary to preclude activation of warhead batteries.

7-6. Storage

Storage precautions for the Lance missile are contained in TM 9-1425-485-10-2. The general instructions for shipment and storage prescribed in TM 9-1300-206 apply to the Lance missile.

7-7. Unsafe Areas and Minimum Safe Distances

Determination of the areas to be designated safe and unsafe during missile firing depends upon the distance from the launch fixture, the amount

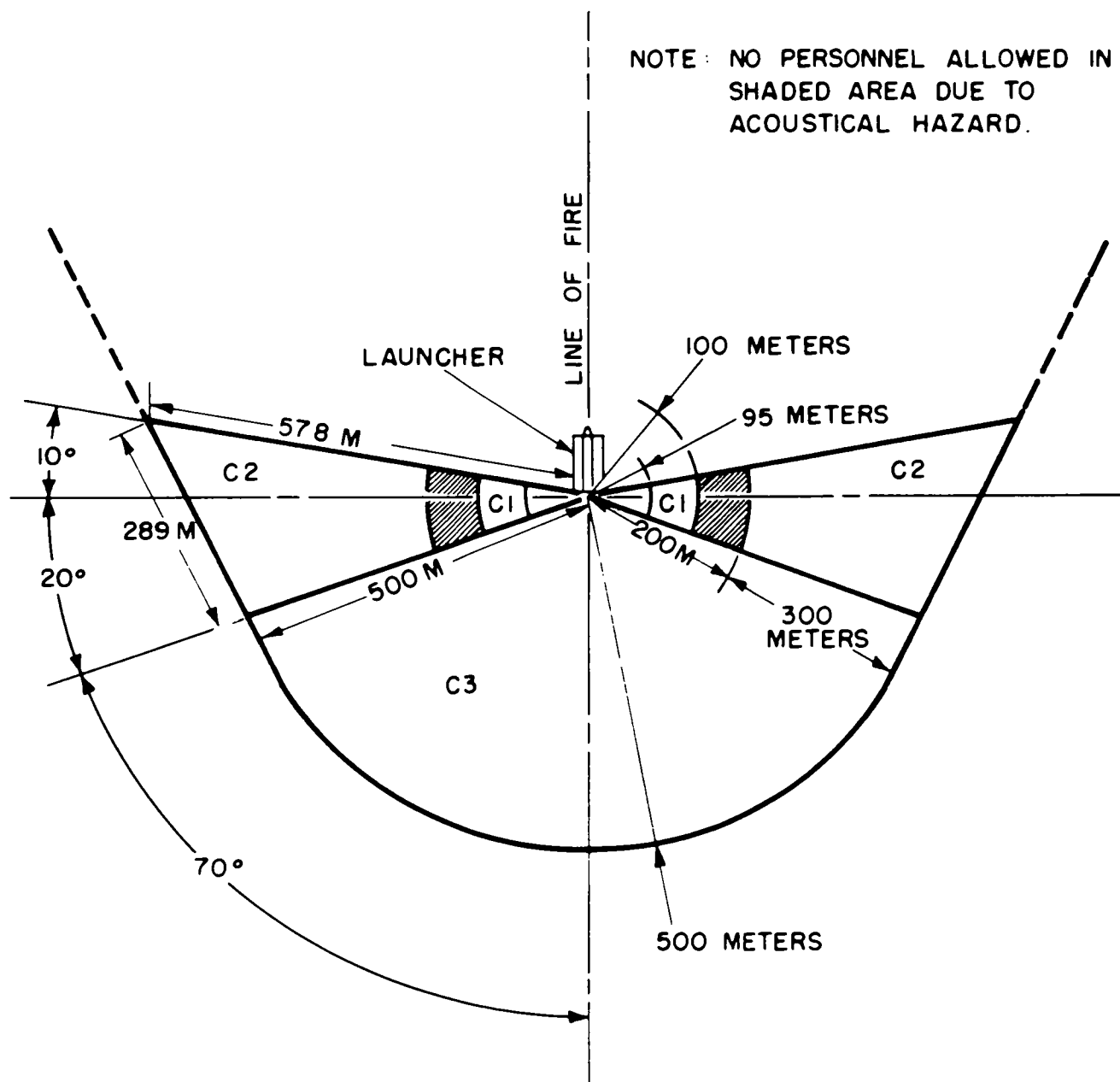


Figure 7-1. Unsafe areas and minimum safe distances.

of barricaded protection available, the direction of fire, and the circumstances surrounding the tactical situation. Certain safe distances should be strictly observed. These unsafe areas and minimum safe distances are explained below (fig. 7-1).

Warning. Distances specified apply to a normal firing and should not be considered sufficient in cases of uncontrollable fire, a hazardous WHS condition, or similar emergencies (TM 9-1115-485-12).

a. C1 represents the minimum safe distance (95 meters) for the firing pit. Personnel in the firing pit should utilize protection afforded by hills, ravines, constructed barricades, or a fox-hole, and should use earplugs to protect their ears from the sound of the blast. The maximum distance for the firing pit is 100 meters, as determined by the 100 meter firing cable from the MP.

b. The area between C1 and C2 shown shaded in figure 7-1 is an acoustical hazard area and

personnel should not be allowed in the area during firing.

c. C2 represents an area beyond the minimum safe distance (200 meters) for equipment and operating personnel (other than the personnel and equipment in the firing pit) during missile firing. Barricaded protection is recommended for personnel in this area as well as protective ear-plugs.

d. The area within a 140-degree angle opposite the direction of fire for a distance of 500 meters from the launch point is considered unsafe for personnel during missile firing because of possible injury from flying debris.

7-8. Propulsion System

a. *General.* The Lance propulsion system (in the main assemblage) is designed to withstand storage in facilities which are not climatically controlled for at least five years with minimal hazard to personnel during handling and launching operations. However, the potential of an accidental propellant leak is not to be discounted, especially under field conditions and tactical operations. Such situations could occur from enemy small arms fire; failure of welded joints in the propellant tanks and external walls of tanks; missile bulkhead fracture, failure of seals, ruptured diaphragms; and damage during handling and shipping. Extreme care must be exercised during handling to prevent damage or puncture of the main assemblage or dropping of the main assemblage container. Use of improper procedures and equipment could lead to serious personnel hazard, injury, or even fatality. General safety requirements involving ammunition and explosives are contained in TM 9-1300-206. This instruction contains additional guidance pertaining specifically to the Lance propulsion system.

b. *Propulsion System.* The Lance propulsion system employs unsymmetrical dimethylhydrazine (UDMH) as fuel, and inhibited red fuming nitric acid (IRFNA) as oxidizer. These liquid propellants are hypergolic, igniting spontaneously with explosive violence when mixed.

(1) *UDMH.* UDMH is a clear, colorless, highly toxic liquid, which has a sharp ammonia-like odor. When UDMH contacts IRENA or other oxidizing material (such as rust), spontaneous combustion occurs. UDMH, although nonsensitive to mechanical shock, is toxic when inhaled, absorbed through the skin, or taken internally.

(2) *IRFNA.* IRFNA is a highly corrosive and toxic reddish-brown liquid, with a sharp, unpleasant odor. IRFNA reacts explosively with organic material and will cause serious burns if the liquid contacts any part of the body. IRFNA gives off suffocating, poisonous, yellowish-red fumes which are highly toxic when inhaled, and are extremely harmful to the eyes, nose, and throat.

c. *First Aid and Self-Aid.*

(1) *UDMH.* If UDMH is splashed on the skin or into the eyes, flush well with large amounts of water. The eyes should be flushed for at least 15 minutes and medical attention sought. If necessary to choose between summoning medical attention and flushing, continue the flushing for at least 10 minutes before going for help. Persons exposed to the vapor should be removed to an uncontaminated atmosphere and kept quiet. If the individual has been completely overcome and breathing has stopped, start artificial respiration immediately after removal from the contaminated area. Skin contamination should be treated by washing immediately with large quantities of water or a diluted solution (approximately 5 percent) of commercial acetic acid. Contaminated clothing should be removed at once to be washed with large quantities of water.

(2) *IRFNA.* If IRFNA is spilled on the skin or in the eyes, immediate removal is essential to avert serious injury. If splashed into the eyes, flush with large amounts of water for at least 15 minutes, with a companion assisting by holding the eyes open if necessary. Medical assistance should be summoned immediately; however, if it is necessary to choose between flushing the eyes and summoning a physician, the eye washing should take precedence for at least 10 minutes, after which medical attention can be summoned. The washing should then be resumed. When liquid splashes onto the skin, the affected area should be immediately and thoroughly washed with large amounts of water or saturated bicarbonate of soda solution if available. Contaminated clothing should be removed immediately to be washed with large amounts of water. Troops exposed to IRFNA fumes should be removed from the contaminated area without delay. If a person has been overcome and breathing has stopped, start artificial respiration immediately after removal from the contaminated area.

Table 7-1. Propulsion System Protective Clothing Requirements

Operation	Hood	Gloves	Suit	Boots	Apron	Face shield	Mask
1. Decontamination and disposal	X	X	X	X	-----	-----	X
2. Fire fighting	X	X	X	X	-----	-----	X

Note. X indicates type of protective equipment required. In any operation where there are exposed fuels or oxidizers or where there is a noticeable odor of the fuel or oxidizer, field protective clothing (hood, suit, gloves, boots, and mask) must be worn.

d. Protective Clothing. Protective clothing required during operations involving propulsion systems are above in table 7-1.

e. Emergency Procedures. Table 7-2 presents a listing of probable emergency situations that could occur and basic corrective action to be taken. It must be understood that it is not possible

to list all emergency situations. Therefore, it is of utmost importance that all personnel involved in the handling and firing of the Lance missile be familiar with the characteristics of the propellants utilized in the Lance missile and the basic emergency procedures to be followed in the event of mishap.

Table 7-2. Emergency Situations and Corrective Actions

Situation	Type Hazard			Corrective actions
	Toxic	Fire	Explosive	
Penetration of one or both propellant tanks.	X	X	X	Clear area of all personnel. Don acid suit and breathing apparatus. Extinguish fire with water fog or spray. Dilute spilled propellant with large amounts of water. Neutralize area with water and notify EOD. Remove associated equipment from area and complete decontamination when authorized by EOD.
Mishandling (Dropping)	X	X	X	Clear area of all personnel. Notify EOD. When authorized by EOD, remove associated equipment from area.
Ignition of Squibs (Inadvertent):				
Thermal Batteries	-----	-----	-----	Fails—Safe. Evacuate the MMA to DS.
Gyroscope	-----	-----	-----	Fails—Safe. Evacuate to the MMA to DS.
BTV (Fuel or Oxidizer)	-----	-----	-----	Fails—Safe. Evacuate the MMA to DS.
Igniter				
SAFE-ARM mechanism in				
SAFE position	-----	-----	-----	Fails—Safe. Evacuate the MMA to DS.
SAFE-ARM mechanism in				
ARM position	X	X	X	Note: Missile may become propulsive. Fuel will be vented overboard. Clear area of all personnel. Notify EOD. Don protective clothing and breathing apparatus. Extinguish fire with water, fog or spray. Dilute spilled propellant with large amounts of water. Neutralize area with water. When authorized by EOD, remove associated equipment from area and complete decontamination. If missile does not become propulsive, wait 60 minutes and follow procedures for failure to fire (para 4-5c, d).
External fire	X	X	X	Clear area of all unnecessary personnel. Deluge missile with water to keep temperature to a minimum. Combat fire in normal manner. If missile becomes propulsive or propellant tanks rupture, follow procedures for Igniter Squib Ignition with SAFE-ARM Mechanism in ARM position. Notify disposal authority.
Leakage (Internal) Oxidizer.	X	-----	-----	Clear area of all personnel. Notify EOD. Don protective clothing and breathing apparatus. Spray area with water fog. When authorized by EOD, remove missile and place missile in disposal area. Notify DS unit.

Table 7-2. *Emergency Situations and Corrective Actions*—Continued

Situation	Type Hazard			Corrective actions
	Toxic	Fire	Explosive	
Fuel -----	X	X	X	Performs same actions prescribed for an oxidizer leak.
Failure to fire -----	X	X	X	See para 4-5.



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CHAPTER 8

TRAINING

8-1. Purpose and Scope

The purpose of this chapter is to present the requirements for training of firing platoon and assembly and transport platoon personnel in the performance of their duties. These requirements are based only on the material contained in the text of this manual. This chapter contains general information on the conduct of training.

8-2. Objectives

a. The objectives are to train crewmen rapidly in their individual duties and, through drill, to form them into an effective, coordinated team that is capable of functioning efficiently and quickly in combat.

b. Each crewman must know the duties of the other crewmen in his section and be able to perform efficiently in those positions as well as his own. This goal is attained by periodically rotating section personnel duties during training.

c. Lance personnel must be able to perform the operations prescribed in this manual equally well during daylight and darkness. Night training under blackout conditions must be stressed.

d. Training in common military subjects will be directed toward attaining and maintaining individual and unit capabilities to accomplish assigned missions under tactical conditions. Unit training should include instruction, practical problems, and field exercises.

e. Safety must be emphasized throughout all training sessions.

8-3. Conduct of Training

a. Training is conducted in accordance with the principles set forth in FM 21-5 and FM 21-6. The goal of training is the attainment of the standards set forth in AR 611-201 and in Army Training Test (ATT) 6-595. Army Training Program (ATP) 6-595 is a guide for preparation of training programs and schedules and

for the conduct of advanced individual and unit training. Army Subject Schedule (ASubjScd) 6-15D10 is a guide in preparation of lesson plans and for scheduling periods of instruction.

b. Individual training is conducted by non-commissioned officers as much as practicable. Officers are responsible for preparing training plans, conducting unit training, and supervising and testing individual training.

c. Throughout training, the application of prior instruction to current training must be emphasized.

d. The training received by each crewman is the responsibility of his section chief. Training progress must be checked frequently by the officer in charge to insure that required high standards of training are maintained.

e. The necessity for developing leadership and initiative in noncommissioned officers must be emphasized constantly throughout training.

f. Realistic training is especially important for a guided missile unit. Simulating essential operations must be avoided. Maximum use should be made of mock firings of training missiles to include section drill on—

- (1) Assembly and disassembly of the missile.
- (2) Loading and off-loading of the SPL, LWL, and LT.
- (3) Emplacement of the SPL and LWL.
- (4) Sighting and laying procedures.
- (5) System checkout and firing.
- (6) Preparation for travel.
- (7) Launcher conversion.
- (8) Survey, with emphasis on speed and accuracy.
- (9) Communications.
- (10) Security.
- (11) Fire direction.

8-4. Guided Missile, Training, XM25

The Guided Missile, Training, XM25 is an inert missile trainer designed for use by the firing

section and the assembly and transport section. It can be used for all missile handling and fire mission training. Two XM25 trainers are authorized for each Lance firing battery.

CHAPTER 9

TESTS FOR QUALIFICATION OF MISSILEMEN

9-1. Purpose and Scope

This chapter prescribes the tests to be given for the qualification of missilemen. The tests are designed to measure a missile crewman's knowledge of all major components in the Lance missile system; they do not require a technical background or school training. Successful completion of these tests qualifies an individual for award of the missile qualification badge in the degree of proficiency shown in paragraph 9-4. The purposes of the tests are to—

a. Provide a means of determining the relative proficiency of the individual crewman in the performance of duties required of members of the Lance firing battery. The tests will not be a basis for determining the relative proficiency of batteries.

b. Serve as an incentive for individuals within the Lance firing battery to expand their knowledge of the complete Lance missile system, thereby increasing their value to the unit.

c. Serve as an adjunct to training.

9-2. Standards

The examinee will be required to perform the tests in accordance with the procedures listed in this manual and the appropriate technical manuals. Although time limits have not been imposed for these tests, an obvious display of technical inefficiency (fumbling, uncertainty, or trial and error solutions) will be cause for halting a test and failing the examinee.

9-3. Qualification Tests

a. The tests below have been prepared in an endeavor to standardize the requirements for the awarding of a missile qualification in all units. Although these tests do not include all possible areas of interest, successful completion of the tests should insure a qualified missileman.

Area	Test	Maximum credit
I.	Missile System (26 points total) (8 tests):	
	1. Does the examinee know the system capabilities and can he give a description of the missile to include the main components of the Lance missile?	5
	2. Can the examinee explain the principles of operation of the Lance missile from launch to warhead event?	2
	3. Can the examinee explain or accomplish the proper opening/closing procedures for main assemblage and warhead section containers?	2
	4. Can the examinee explain the proper procedures for emergency destruction of the Lance missile?	4
	5. Can the examinee explain the characteristics of the propellants contained in the propulsion system, the hazards of these propellants, and the first aid procedures applicable to these propellants?	4
	6. Is the examinee familiar with the FM and TM applicable to the Lance missile system?	5
	7. Can the examinee explain the procedures utilized for conversion of the SPL to LWL and the LWL to SPL?	2
	8. Can the examinee explain the procedures used for erecting and lowering of the tripod hoist?	2
II.	Sighting and Laying (22 points total) (5 tests):	
	1. Is the examinee familiar with the survey requirements for a firing position?	2
	2. Is the examinee familiar with T2 theodolite operation?	5
	3. Can the examinee demonstrate bore-sighting-autocollimation?	5
	4. Can the examinee demonstrate sighting and laying procedures for the Lance missile system—SPL mode? ...	5
	5. Can the examinee demonstrate sighting and laying procedures for the Lance missile system—LWL mode? ..	5
III.	System Checkout and Firing (22 points total) (5 tests):	
	1. Can the examinee demonstrate how to prepare the monitor-programmer (MP) and firing device for use?	3

Area	Test	Maximum credit
	2. Can the examinee demonstrate system checkout procedure?	6
	3. Does the examinee understand the functions of all crew members during emplacement and preparation for firing of the SPL and LWL?	5
	4. Can the examinee explain a failure to fire and actions required if one occurs?	3
	5. Does the examinee understand the functions of all crewmen during preparation for travel of the SPL and LWL?	5
IV. Loading and off-loading (15 points total) (5 tests):		
	1. Does the examinee understand the operation of the boom on the loader-transporter and does he recognize and understand the appropriate hand signals?	2
	2. Can the examinee properly install the XM22E1 sling on the Lance missile for loading and off-loading?	2
	3. Does the examinee know the proper positioning of the missile containers and/or vehicles during loading and off-loading with the loader-transporter and the tripod hoist?	2
	4. Can the examinee explain the sequence of events during loading and off-loading of the missile or main assemblage?	4
	5. Does the examinee understand the duties of all crewmen during loading and off-loading procedures?	5
V. Assembly and Disassembly (15 points total) (4 tests):		
	1. Can the examinee demonstrate properly connection and disconnection of the cable from P1 to J1, the proper tightening and loosening sequence of the WHS T-bolts, and the proper torque value for the T-bolts during mating procedures?	4
	2. Does the examinee know the proper positioning of the missile containers and vehicles during mating and demating with the loader-transporter and the tripod hoist?	2
	3. Can the examinee explain the sequence of events during mating and demating of the WHS and main assemblage? ..	4
	4. Does the examinee understand the duties of all crewmen during mating and demating procedures? ..	5
	Maximum possible total	100

b. Successful completion (without fumbling and uncertainty) of each test entitles the examinee to maximum credit. Mistakes, discrepancies, or other examples of poor performance should be weighted accordingly. For example, if the examinee successfully completes a test, but only after having received some guidance or having evidenced stumbling or uncertainty, he should receive a one or two point deduction. If he fails to complete a test, he will receive no credit.

9-4. Qualification Scores

Minimum scores required for qualification of missilemen are:

Expert Missileman	90 points
First Class Missileman	80 points
Second Class Missileman	70 points

9-5. Assistance

The examinee will receive no unauthorized assistance. Assistants will be furnished to the examinee as required for each test. The assistants will perform duties as they are assigned by the examinee. Assistants will not volunteer information but will execute the examinee's commands to the best of their ability. When erroneous commands are given, the assistants should so inform the examiner prior to acting on the commands. If an examinee fails a test because of the fault of the examiner or an assistant, the test will be disregarded, and the examinee will be given another test of the same nature.

9-6. Conduct of Tests

At the start of a test, the condition of the equipment should be the same as it would be during normal operations. The examiner will explain to the examinee the scope of the test and indicate the men who will act as assistants. The examiner will also furnish the examinee with any check sheets or related materials required. During the test, the examiner will insure that the examinee makes no mistakes which would be harmful to personnel or equipment. At the completion of the test, the examiner will critique the examinee's performance and turn in a tentative score to the battery commander, who will question the examinee and the examiner as to the reasons for the examiner's tentative score. The battery commander will finalize the score and forward the test score to battalion.

APPENDIX A

REFERENCES

A-1. Army Regulations (AR)

50-5	Nuclear Surety.
55-203	Movement of Nuclear Weapons, Nuclear Components, and Related Classified Nonnuclear Materiel.
220-58	Organization and Training for Chemical, Biological, and Radiological (CBR) Defense.
310-1	Military Publications—Publications, Blank Forms, and Printing Management.
310-25	Dictionary of United States Army Terms (Short Title: AD).
310-50	Authorized Abbreviations and Brevity Codes.
380-5	Department of the Army Information Security Program.
380-20	Restricted Areas.
385-32	Protective Clothing and Equipment.
385-62	Firing Guided Missiles and Heavy Rockets for Training, Target Practice, and Combat.
600-55	Motor Vehicle Driver—Selection, Testing, and Licensing.
604-5	Clearance of Personnel for Access to Classified Defense Information and Material.
611-201	Enlisted Military Occupational Specialties.
672-5-1	Awards.
710-1	Army Materiel Maintenance Concepts and Policies.

A-2. Field Manuals (FM)

5-20	Camouflage.
5-25	Explosives and Demolitions.
6-2	Field Artillery Survey.
6-10	Field Artillery Communications.
6-20-1	Field Artillery Tactics.
6-20-2	Field Artillery Techniques.
6-40	Field Artillery Cannon Gunnery.
(C) 6-40-2	Field Artillery Missile Gunnery (U).
** (C) 6-42	Field Artillery Battalion, Lance (U).
6-140	Field Artillery Cannon Battalions and Batteries.
(C) 6-141-1	Nonnuclear Employment of Field Artillery Weapon Systems (Selected Munitions) (U).
9-14	Explosive Ordnance Disposal Service.
19-30	Physical Security.
21-5	Military Training Management.

**To be published.

21-6	Techniques of Military Instruction.
21-40	Chemical, Biological, Radiological, and Nuclear Defense.
21-41	Soldier's Handbook for Defense Against Chemical and Biological Operations and Nuclear Warfare.
21-48	Chemical, Biological, and Radiological (CBR) and Nuclear Defense Training Exercises.
21-60	Visual Signals.
22-5	Drill and Ceremonies.
24-18	Field Radio Techniques.
24-20	Field Wire and Field Cable Techniques.
31-36 (TEST)	Night Operations.
57-35	Airmobile Operations.
101-31-1	Staff Officers' Field Manual: Nuclear Weapons Employment Doctrine and Procedures.
(S) 101-31-2	Staff Officers' Field Manual: Nuclear Weapons Employment Effect, Data (Modified) (U).

A-3. Technical Manuals (TM)

3-210	Fallout Prediction.
3-220	Chemical, Biological, and Radiological (CBR) Decontamination.
5-236	Surveying Tables and Graphs.
5-241-1	Grids and Grid References.
5-241-2	Universal Transverse Mercator Grid; Zone to Zone Transformation Tables.
5-6675-207-15	*Operator and Organizational, Maintenance Manual: Surveying Instrument, Azimuth Gyro: Artillery; with Gyroscope Housing Electronics Null Indicator and Mounting Base.
5-6675-296-12	*Operator, Organizational, DS, GS, and Depot Maintenance Manual: Theodolite, Directional, 0.002 mil Graduation, 5.9 in. Long Telescope, Detachable Tribrach w/Accessories and Tripod (T2-68 MIL)
6-230	Logarithmic and Mathematical Tables.
6-300	Army Ephemeris.
(C) 9-1115-485-12	Nuclear Warhead Section XM234 (U).
9-1300-206	Care, Handling, Preservation, and Destruction of Ammunition.
9-1336-486-12	Operator and Organizational Maintenance Manual: High Explosive Warhead Section: XM198, Practice
9-1336-487-12	Operators' and Organizational Maintenance Manual: (Including Repair Parts and Special Tools List) Warhead Section, Guided Missile, Training, XM 201
9-1425-485-10-1	Lance Missile System, System Description Manual
9-1425-485-10-2	Lance Missile System Operator's Manual
9-1425-485-20	Organizational Maintenance Manual for Lance Guided Missile System
9-1425-485-ESC	Lance Equipment Serviceability Criteria.
9-1450-485-10	Operating Instructions for Carrier, Guided Missile Equipment: XM667E1.
9-1450-485-20	Organizational Maintenance for Carrier, Guided Missile Equipment: XM667E1.
9-1450-485-ESC	XM667E1 Equipment Serviceability Criteria.

*Refer to DA Pam 810-4 for complete listing of all manuals covered in this area.

9-2300-257-10	*Operator's Manual, M113A1 Armored Personnel Carrier Family of Vehicles.
9-2300-257-20	*Organizational Maintenance Manual, M113A1 Armored Personnel Carrier Family of Vehicles.
10-279	Protective Clothing for Missile Fuel Handlers.
38-750	The Army Maintenance Management System (TAMMS).
750-229	Procedures for Rapid Deployment, Redeployment and Retrograde for Lance Guided Missile Item (Lance Guided Missile System).
750-244-4-1	Organizational Maintenance Manual: Destruction of Equipment to prevent Enemy Use (Lance Guided Missile System).

A-4. Tables of Organization and Equipment (TOE)

6-595	Field Artillery Battalion, Lance.
6-596	Headquarters and Headquarters Battery, Field Artillery Battalion, Lance.
6-597	Field Artillery Battery, Field Artillery Battalion, Lance.
6-599	Service Battery, Field Artillery Battalion, Lance.

A-5. Miscellaneous

DA Pam 108-1	Index of Army Motion pictures and Related Audio-Visual Aids.
DA Pam 310-series	Military Publications Indexes.
TB Med 223	Respiratory Protective Devices
TB Med 242	Health Hazards from Propellant Fuels and Oxidizers.
ATP 6-595	**Field Artillery Battalion, Lance.
ATT 6-595	**Field Artillery Battalion, Lance.
ASubjScd 6-15D10	**MOS Technical Training and Refresher Training of Lance Missile Crewman—MOS 15D10.
STANAG 2103	Reporting Nuclear Detonations, Radioactive Fallout, and Biological and Chemical Attacks.
STANAG 2113	Destruction of Military Technical Equipment.
STANAG 2314	Organization and Doctrine for Explosive Ordnance Disposal Operations.

*Refer to DA Pam 310-4 for complete listing of all manuals covered in this area.

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APPENDIX B

ABBREVIATIONS

AD	Army Dictionary	LT	Loader-transporter (XM688E1)
ADJ	Adjust	LWL	Launcher, lightweight (M740)
APU	Anti-propulsion unit	<i>th</i>	Mils
AR	Army Regulation	ma	Milliamp
ASST	Assistant	Med	Medical
ASubjscd	Army Subject Schedule	MMA	Missile main assemblage
A&T	Assembly and transport	MP	Monitor-programmer
ATP	Army Training Program	Msl	Missile
ATT	Army Training Test	NBC	Nuclear, Biological and Chemical
BTV	Boost termination value	NAIC	Nuclear Accident and Incident Control
CAL	Calibration	OP	Operator
CBR	Chemical, biological, and radiological	PAL	Permissive action link
CG	Center of gravity	Pam	Pamphlet
C/S	Section Chief	para	Paragraph
DA	Department of the Army	Plt	Platoon
DS	Direct support	PTO	Power take-off
DVR	Driver	PWR	Power
EED	Electro-explosive device	RF	Radio frequency
EML	Equipment maintenance log	rpm	Revolutions per minute
ESC	Equipment serviceability critia	RTO	Radio telephone operator
FDC	Fire direction center	SLO	Suspension lockout
Fig	Figure	SOP	Standing operating procedure
FM	Field Manual	SPGG	Solid propellant gas generator
ft	Foot	SPL	Self-propelled launcher (XM752)
G&C	Guidance and control	STANAG	Standardization agreement
GNR	Gunner (Assist Section Chief)	TAMMS	The Army Maintenance Management System
GS	General support	TB	Technical Bulletin
IRFMA	Inhibited Red Fuming Nitric Acid	TOE	Table of Organization and Equipment
lb	Pound	UDMH	Unsymmetrical Dimethylhydrazine
Ldr	Leader	WHS	Warhead section
L/S	Launcher specialist		



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APPENDIX C

NOMENCLATURE

OFFICIAL NOMENCLATURE CHART

<i>End item common name</i>	<i>Official nomenclature</i>
LANCE MISSILE	GUIDED MISSILE, SURFACE ATTACK: XMGM-52C
CONTROL SURFACE (Small)	CONTROL SURFACE, GUIDED MISSILE: M30
CONTROL SURFACE (Large)	CONTROL SURFACE, GUIDED MISSILE: M29
MISSILE MAIN ASSEMBLAGE (MMA) ...	GUIDED MISSILE MAIN ASSEMBLAGE: M5
GUIDANCE SET	MISSILE GUIDANCE SET: AN/DJW-48
<i>Missile Trainer</i>	
TRAINER	GUIDED MISSILE TRAINING: XM25
M6 MAIN ASSEMBLAGE	GUIDED MISSILE MAIN ASSEMBLAGE, TRAINING: M6
GUIDANCE SET	MISSILE GUIDANCE SET, TRAINING: AN/DJW-48-T1
CONTROL SURFACE (Large)	CONTROL SURFACE, GUIDED MISSILE, TRAINING, M32
CONTROL SURFACE (Small)	CONTROL SURFACE, GUIDED MISSILE, TRAINING, M33
<i>Ground Support Equipment</i>	
LIGHTWEIGHT LAUNCHER	LAUNCHER, ZERO LENGTH, GUIDED MISSILE: M740
FIRING DEVICE	FIRING DEVICE, GUIDED MISSILE M91
MONITOR-PROGRAMMER	MONITOR-PROGRAMMER, MISSILE GUIDANCE SET: AN/GJM-24
SELF PROPELLED LAUNCHER	LAUNCHER, GUIDED MISSILE, CARRIER MDUNTED: M752
CARRIER	CARRIER, GUIDED MISSILE EQUIPMENT: M667
LOADER-TRANSPORTER	LOADER-TRANSPORTER, GUIDED MISSILE: M688
HANDLING UNIT	HANDLING UNIT, GUIDED MISSILE EQUIPMENT: M39
TRIPOD	HOISTING UNIT, TRIPOD: M38
SLING	SLING, BEAM TYPE: M22
FIN CONTAINER (Small)	SHIPPING AND STORAGE CONTAINER, GUIDED MISSILE CON- TROL SURFACES: M596
FIN CONTAINER (Large)	SHIPPING AND STORAGE CONTAINER, GUIDED MISSILE CON- TROL SURFACES: M597
TEST SET (GMSTS)	TEST SET, GUIDED MISSILE SYSTEM AN/TSM-84 (XO-2)
MOBILITY KIT	MOBILITY KIT, GUIDED MISSILE LAUNCHER: M234
AZIMUTH LAYING SET	AZIMUTH LAYING SET
MMA CONTAINER	SHIPPING AND STORAGE CONTAINER, GUIDED MISSILE MAIN ASSEMBLAGE: M599



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By Order of the Secretary of the Army:

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